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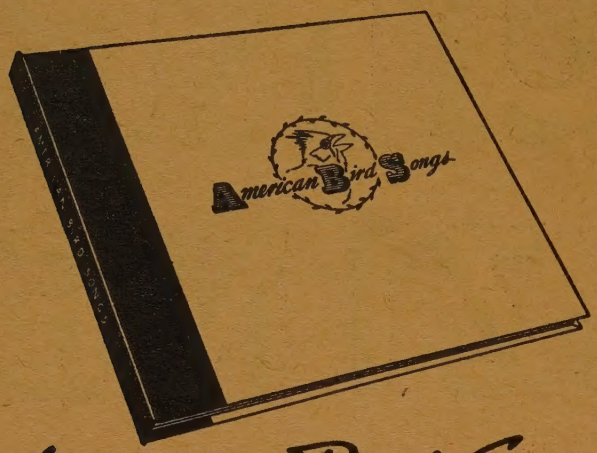
SEVENTY-TWO AMERICAN BIRD SONGS

ON PHONOGRAPH RECORDS



American Bird Songs

These Phonograph Bird Song Records are from the Laboratory of Ornithology, Cornell University. They were recorded in Native Wilds by the Albert R. Brand Bird Song Foundation.

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THE PROCESS OF RECORDING

These recordings were all made in the birds' natural haunts. The scientists used a sensitive microphone at the focal point of a three-foot parabolic sound-reflector which was aimed, like a gun, at the singing bird. The sound waves thus intercepted were transformed by the microphone into electrical impulses, much amplified in a sound-truck, and then used to vibrate a delicate galvanometer on which was fastened a tiny mirror. A slender beam of light shining on this vibrating mirror was deflected to a 16-millimeter film which passed from one magazine to another at a constant rate of speed. Thus the bird's song was photographed so that the image or sound-track developed on the film could be used in a reverse process and made to reproduce the song, which was then, in the laboratory, recorded on a phonograph disk.

The bird's song had to be amplified several thousand times. That means that extraneous sounds, such as wind in trees, running water, airplanes, farm machinery, and notes of other birds were amplified too. For that reason many promising attempts at recording proved failures. The songs here recorded represent the best results of many efforts.

YOU GET 72 BIRD VOICES ON 12 RECORD SIDES

Each Song Introduced and Identified

Birds of the Northwoods

No. 1 A

1. Olivebacked Thrush
2. Veery
3. Wood Thrush
4. Hermit Thrush
5. White-throated Sparrow
6. Whip-poor-will

No. 1 B

1. Scarlet Tanager
2. Rose-breasted Grosbeak
3. Slate-colored Junco
4. Yellow-bellied Sapsucker
5. Alder Flycatcher
6. Olive-sided Flycatcher

Birds of Fields and Prairies

No. 4 A

1. Bobolink
2. Meadowlark
3. Western Meadowlark
4. Vesper Sparrow
5. Field Sparrow
6. Red-winged Blackbird

No. 4 B

1. Prairie Horned Lark
2. Savannah Sparrow
3. Lark Sparrow
4. Killdeer
5. Spotted Sandpiper
6. Burrowing Owl

Birds of Northern Gardens and Shade Trees

No. 2 A

1. Song Sparrow
2. Robin
3. Catbird
4. Baltimore Oriole
5. Yellow Warbler
6. Flicker

No. 2 B

1. Chickadee
2. Wood Pewee
3. Chipping Sparrow
4. Red-eyed Vireo
5. Yellow-throated Vireo
6. Warbling Vireo

North American Game Birds

No. 5 A

1. Ruffed Grouse
2. Bob-white
3. Wild Turkey
4. Dusky Grouse
5. Prairie Chicken
6. Chachalaca

No. 5 B

1. Gambel's Quail
2. California Quail
3. White-winged Dove
4. Woodcock
5. Canada Geese
6. Mallard Duck

Birds of Southern Woods and Gardens

No. 3 A

1. Indigo Bunting
2. Pine-woods Sparrow
3. Pine Warbler
4. Orchard Oriole
5. Yellow-breasted Chat
6. Carolina Wren

No. 3 B

1. Mockingbird
2. Brown Thrasher
3. Cardinal
4. Summer Tanager
5. Chuck-will's-widow
6. Barred Owl

Birds of Western North America

No. 6 A

1. Wren Tit
2. California Thrasher
3. Nuttall's Sparrow
4. Fox Sparrow
5. Western Tanager
6. Black-headed Grosbeak

No. 6 B

1. Lazuli Bunting
2. Blue Grosbeak
3. California Shrike
4. California Purple Finch
5. Plumbeous Vireo
6. California Woodpecker

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General Zoology

Textbook of General Zoology. By Winterton C. Curtis and Mary J. Guthrie. New York. 1947. John Wiley and Sons. Fourth Edition. 794 pages. Illustrated. $4.50.

Originally published in 1927, this zoology text is, in this fourth edition, carefully edited and revised both as to text and illustration. Several chapters have been extensively revised, and a new chapter on the organ systems of invertebrates has been added.

Forest Cooperatives

"Forest Cooperatives" is the title of Report 6 from a reappraisal of the forest situation by the United States Forest Service. It indicates the possibilities of the forest cooperative in helping farmers and other owners of small woodlands to become more independent and self-supporting, thus "to strengthen our rural economy and to sustain the best qualities of the American tradition of free enterprise."

Plant Anatomy

An Introduction to Plant Anatomy. By Arthur J. Eames and Laurence H. McDaniels. New York. 1947. McGraw-Hill Book Company. Second Edition. 427 pages. Illustrated. $4.50.

In bringing out this new edition of this excellent text, the authors have brought each chapter up to date with advances in knowledge in the field of plant anatomy and allied fields. The first edition was published in 1925.

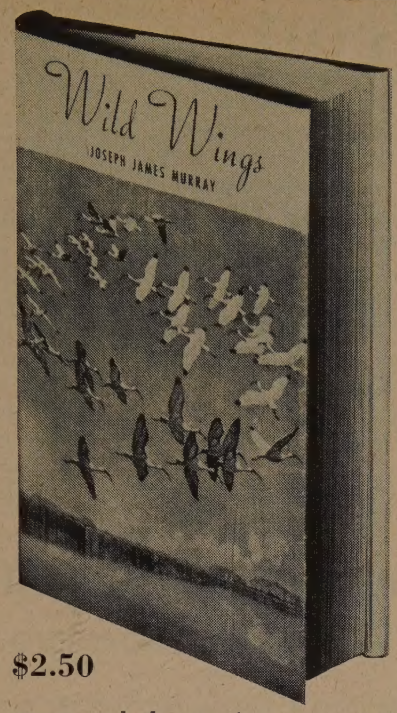
Maine Conifers

Through a handy little twenty-page bulletin entitled "The Conifers of Maine" the College of Agriculture, University of Maine, Orono, Maine, presents information on these native softwoods. The bulletin is written by Fay Hyland and presents excellent identification drawings together with accompanying descriptive text.

Nature Drawing

Oddities of Nature and How to Draw Them. By Chuck Thorndike. New York. 1947. Pitman Publishing Corporation. 48 pages. Illustrated. $1.00.

This booklet not only contains instructions for the young aspiring artist on how to reproduce anything from fish to foxes on paper, but also includes interesting facts about each subject. It is compiled in a style similar to Robert Ripley's well known "Believe It or Not" drawings. An extremely simplified version of the completed sketch is included to aid any who like to create with pencil or pen; thus the artist learns by copying and the fact-lover by reading. There is no duplication, except for guidance, and the youngsters are given an opportunity to see for themselves the peculiarities of Nature.



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Wild Wings

by Joseph James Murray

Dr. Murray, who is a minister of the Gospel in the Presbyterian Church, U. S., is widely recognized as an authority on birds. He has served as secretary of the board of directors of the National Audubon Society, is a member of the Wilson Ornithological Club, and edits *The Raven,* journal of the Virginia Society of Ornithology.

The book is profusely illustrated with photographs from the National Audubon Society files and has a beautiful color plate jacket from the same source. The chapters are short, informal chats about birds, made even more delightful because the author is relating his own experiences and observations of bird life and customs. One goes with him on walks through the countryside of his Virginia home, over the hills into more distant parts of the United States, and finally sails with him across the seas to enjoy the birds of far horizons.

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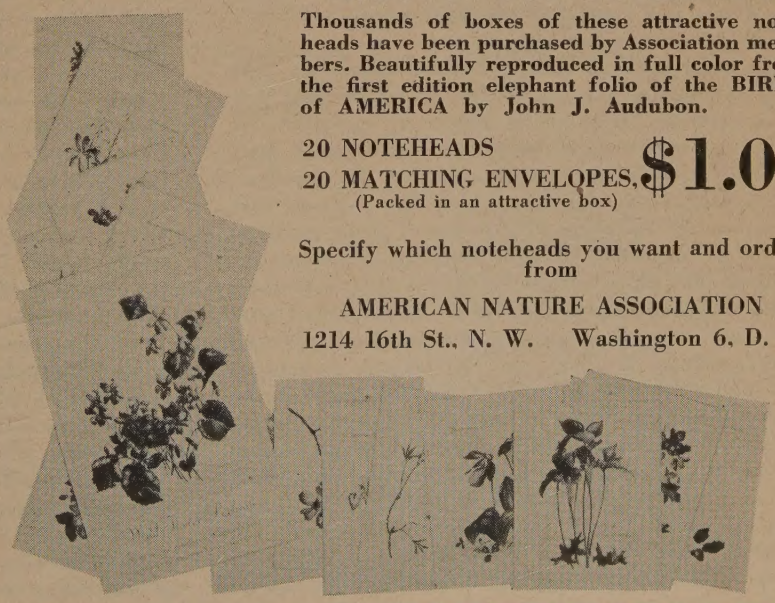

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Nature in Print

By HOWARD ZAHNISER

IF SOMEONE in every American family would read *Our Flowering World* by Rutherford Platt and *The Great Forest* by Richard G. Lillard—then show the rest of the family the illustrations and summarize what the books say—both the immediate and the enduring effects on our civilization ought to be profound. With Mr. Platt's perspective of geologic ages and Mr. Lillard's perspective of American history the American people would surely make into dominant public policy the good forestry programs that such a few conservationists—even at this late hour—are supporting in earnest.

The more one studies the problems that Americans are dealing with in trying to live within their natural resources, the more one is impressed with the central importance of a prudent and understanding administration of forests. Face the problem of preventable erosion, investigate the prospects for reducing damage from floods, consider the vital necessity of insuring water supplies—and each perplexity begins to find its solution in the forest. Wish earnestly for an abounding wildlife and realize how much of the fulfillment will have to be in the woods. Start out to perpetuate a few remnants of the American wilderness and see how soon the enterprise leads to forest conservation. Or face such problems as housing and paper shortages.

Wood products are so essential to American civilization that they are not likely to be replaced as long as there are forests growing anywhere. Even uses that in the context of basic realities seem trivial must be considered indispensable and reckoned with seriously. Mr. Lillard quotes a parody on Joyce Kilmer's *Trees* that salutes in one of its stanzas—

> A tree that grows through sunny noons
> To furnish sporting page cartoons—

yet who can visualize the abandonment of the "funnies" as long as there is pulpwood growing anywhere? Other demands that our way of living is making on the forests are so varied and fundamental that any conservationist—whatever his most cherished resource may be—must realize that in the American economy no value of the forest is in our time going to take precedence over its usefulness as a source of wood products. Anyone who is tempted to underestimate the persistence of timber-cutting and pulpwood-cutting demands even in the face of denuded watersheds—not to mention the destruction of wildlife habitat and the annihilation of wilderness—need only read Mr. Lillard's chapter on "Forest in the Machine Age" to be convinced that only the end of the world—our world as we know it—could end the cutting of trees. Or he need only consider the many forest products that he himself could not imagine himself without while still being himself! In fact, nearly all of us accept a vocabulary in which every benefit of the forest except its harvested wood is called a by-product.

How deeply, then, should we all be concerned with good forestry wherever timber is being cut! If the nation ever reaches the boundaries of its national parks without timber to cut, what chance will there be for saving the trees of the parks? On the Olympic Peninsula in the State of Washington, even now, the relatively small areas of primeval rain forests within the Olympic National Park are in jeopardy because the mills of the region could, by cutting them, postpone for a half dozen years or so a conversion that is inevitable. Only the most earnest and concerted efforts of park preservers everywhere will make it possible for the Olympic National Park to survive this hazard unimpaired, simply because the American public is so conscious of its needs for wood products that the "hardships" of its wasteful timber cutters can be balanced against the sanctity of one of our very few primeval national parks. Surely there is no enduring hope for the preservation uncut of any American forest unless prudent, unwasteful forestry is practiced on all the forests still to be harvested.

Nor is it the forester alone who is to be educated. The waste that is needlessly pushing us farther and farther up into our critical watersheds, and nearer and nearer to the areas we would like to see preserved, is by no means entirely a willful waste by the timber man. Consumers are still insisting on only the best, still making it more profitable for the lumberman to leave his waste in the woods than to process it for the market. I am looking for the best twelve-inch boards I can get for some bookshelves, and have to get this far into a discussion of forest conservation to wonder about who is going to put to use the second-best if I insist only on the best! We are all far from realizing adequately the imperative necessity of seeing that our forests for wood products are so handled and their products so used that they will be made to meet our wood-product needs, if our forests for other purposes are going to stand. And we are far from realizing how important it is to make every possible forest serve multiple uses—not only providing wood but also conserving rainfall, preventing erosion, harboring wildlife, affording recreation, and at the same time sustaining itself.

Rutherford Platt, in a magnificently illustrated and eloquently, simply written volume, has provided every reader with an opportunity to sense vividly what a marvelous heritage of the ages our forests actually are. The forest of his story, he says, extends "north of the Southern Softwood Forest, east of the treeless great plains," but the extent of the significance of his book can not be so easily limited. When Mr. Platt calls the forest "the breath of the earth's crust," and likens it to "a vapor thrown off when air, water, and land are fused," he induces an appreciation that will enrich the experience of readers anywhere. When he describes the trees and their parts, and other plants with which they grow, when he pieces together in narrative the evidences of the emergence of these forms of life and reconstructs in imagination the ice ages, when he finally writes in analytic detail what is nevertheless essentially a descriptive apostrophe to the seed, he evokes a profound respect for the flowering world, especially the flowering world of trees that is the forest. Mr. Platt's work is thus not only an informative volume, and one that is pleasant to read, but it is also a scripture of reverence "at the massive sweep of life on this planet, powered by the living cell." He is modestly correct in concluding that "perhaps for some of us the impact . . . has been a spiritual experience."

Such experience as Mr. Platt's in the forest is surely a conditioning for conservation, leading as it does to a respect for Life, to a realization that men are members of a great com-

Cutting of the Oaks

By MAY ALLREAD BAKER

Deep in the wood I hear the rhythmic strokes
Of axes ringing in the frosty air,
And see the woodsmen, busy here and there,
Upon the pillars of the lofty oaks.
This is the last they'll look upon the sun,
Where they began a hundred years, or more,
As tiny sprouts upon the forest floor,
For now, their skyward journeying is done.

Keen is the saw; and keen the bladed axe;
And both cut deep into the clean, white wood.
Each stricken giant trembles in its tracks;
Each sways and bends, where it so long has stood.
Then, with a crash like thunder over all,
The earth is shaken as these monarchs fall.

munity of living things in which the flowering world is critically essential to all the rest of the community, most especially to men. How the most favored men of our time—the Americans—have dealt with the trees in their living community is the theme of Mr. Lillard's volume *The Great Forest*, and it is hard to see how anyone at all conditioned for conservation could read it without feeling that it is timely information for an intensified campaign for good forestry. Nor is it easy to imagine anyone reading *The Great Forest* without becoming so conditioned.

In a competent work, complete with a scholarly appearing bibliography, impressive acknowledgments, and valuable or curiously interesting appendixes, Mr. Lillard has told the American history of forests down to the present time and has told it in a way that will appeal to those interested in history as much as to those concerned with forests. It is not a story to be read with complacence, by any means, yet it is one with elements of hope that emerge long before its closing pages have been reached and one that Mr. Lillard himself can leave on a note of optimism.

"Though the virgin wilderness is now gone except for isolated patches," he says in his concluding paragraph, "sturdy growths of new forest ripple over whole valleys and are rising toward the hilltops in a slow green tide. The decades are returning plowland to wood lots, stumpland to tree farms. The long epic of agricultural settlement has ended, and prodigal lumbering hurries toward its close, but new stories are in their opening chapters. The forest is an industrial crop for the new technology. The forest is a people's playground, a refuge from mechanized life and mass neurosis. East of the prairies and west of the deserts the continent no longer contains the unbroken oceans of trees that thrilled the first to explore, but its mighty forests, wonderful still, will play in the future, as in the past, a major role in fulfilling the promise of American life."

Such works as *The Great Forest*, which is perhaps the year's most important volume on a natural resource, can help greatly in insuring this fulfillment by bringing to the general public an understanding of what forestry in America has been and is, and surely this public once informed will see to it that the forestry of the future is good forestry.

Our Flowering World. By Rutherford Platt. New York: Dodd, Mead and Co. 1947. 278 pp., with 38 color photographs on 8 plates, 128 black and white photographs on 46 plates, half-tone pictograph of geologic ages, 27 text drawings, endpaper photograph, list of books for further reading and reference, and index. $6.

The Great Forest. By Richard G. Lillard. New York: Alfred A. Knopf. 1947. xxiv + 399 pp., with 43 photographs on 24 plates (including some reproductions of old prints), 8 text figures (including cartoon by J. N. Darling), appendixes on Big American Trees (a tabulation), The Most Famous Log Cabin, Diagram of . . . Skidder, Relative Value of Forest Crops, Uses of Lumber in Construction, A Few of the Thousands of Present Day Uses of Wood, Products Using Naval Stores, and The Wooden Dragger *Columbia*, bibliography, and index. $5.

Pinchot Autobiography

Breaking New Ground. By Gifford Pinchot. New York. 1947. Harcourt, Brace and Company. 522 pages. Illustrated. $5.00.

Dedicated "to the men and women of the Forest Service, whose courage, devotion, and intelligence have made it and kept it the best organization in the Government of the United States," this book is an autobiography of twenty-three years in the life of a man who name is indelibly inscribed in the history of forestry in America. It is the story of a great popular movement, and of a man whose place in that movement was as colorful as it was important. It is a story of battle against sometimes corrupt bureaucracy; of a fight against selfish private interests bent on exploitation. Mr. Pinchot starts with his decision to become a forester, just after his graduation from Yale in 1889, and carries through to 1912. This is a book that everyone interested in conservation should read for its outstanding historical value. The fight for forest conservation was the springboard from which conservationists leaped into the wider battle for conservation of all natural resources, a battle that still rages.

About Earthquakes

When the Earth Quakes. By James B. Macelwane. Milwaukee. 1947. The Bruce Publishing Company. 288 pages. Illustrated. $5.00.

In this book, in popular terms, is presented the knowledge that man has accumulated with respect to the nature and causes of earthquakes. Seismologists have been probing and classifying and interpreting the tremblings of the earth. Father Macelwane, who is dean of the St. Louis University Institute of Geophysical Technology, has brought together all this knowledge, presented in terms that will interest and inform the layman, and has, at the same time, produced a book that will be of value to the architect, the engineer, the prospector and, indeed, the insurance man. This volume is one in the Science and Culture Series being brought out under the general editorship of Joseph Husslein, S.J.

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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great National Resources of America

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Sea Lion Slaughter

Alarming news reaches us from California, indicating the possibility of a poison campaign endangering the existence of the State's famous herds of sea lions. An increasing number of dead animals are being found on the beaches, to which the ailing sea lions have gone to die.

Health authorities have diagnosed the cause of death to be streptococcal pneumonia, and there seems to be little doubt that this was the immediate cause. However, Paul Bonnot, aquatic biologist of the State Bureau of Marine Fisheries, and noted sea lion authority, declares: "They died from pneumonia, all right, but I suspect that poison induced the pneumonia."

This would not be the first attempt by fisheries interests to wipe out the animals. It is contended by fishermen that the sea lions are guilty of breaking nets and releasing catches, as well as affecting the supply of fishes. With respect to this latter charge, Mr. Bonnot points out that the animals undoubtedly have long served as a natural check on undesirable or harmful organisms in the sea, keeping trash and predatory fishes in balance. Elimination of Nature's control through the sea lions would probably result in other dangers to the fish supply.

In response to demands by the fisheries interests, the State Division of Fish and Game in 1946 issued ten permits—as part of a drive to cut the sea lion numbers—to individuals to take the animals. One permittee took 400 animals, but the kill of the other nine does not appear to be a matter of record. Nor is there any record of the kill by fishermen, who may, under the law, kill sea lions on sight, on the ground that they are menacing their business.

In other words, the Division of Fish and Game shows little solicitude for one of our most interesting mammals, and seems to know little or nothing about what is going on; or, perhaps, chooses to make no admissions. Now, however, come these wholesale deaths through what superficially is described as an epizootic among the sea lions. There is no record of any such animal epidemic having taken place before, a fact that adds strength to Mr. Bonnot's strong suspicion of poisoning. At first only the California sea lions seemed to be affected, the herds of Steller sea lions appearing to be untouched by the finger of death until some were found dead at Drakes Bay.

Biologically the sea lion herds of the California coast undoubtedly are important. They are also interesting members of our fauna, and an important tourist attraction. For all these reasons they should be protected and everything possible done to learn about their place in Nature's scheme. Certainly neither the people of California, nor of the United States, should permit special interests to take matters into their own hands through a poison campaign or other wholesale assault upon any species. This is a matter that concerns all conservationists.

For Olympic Park

Although it originally acquiesced in the program to appease the lumber interests of the State of Washington by permitting revision of the boundaries of Olympic National Park, the U. S. Department of the Interior has now changed its stand and will oppose all of the pending bills seeking to permit exploitation of this area. This change in stand will be hailed by all conservationists.

When the boundary change was first proposed, and justified on the ground that it would make park administration easier, most conservation groups, including the American Nature Association, took violent exception. Protests against thus knuckling under to timber interests, and weakening the defenses thrown around our national parks, were loud, widespread and numerous. When hearings were held in the State of Washington, this past summer, conservationists made a strong case, and the eyes of members of the Public Lands Committee of the House of Representatives were opened. Finding itself assured of such strong support, the Interior Department was able to retreat from what we like to think was a reluctant appeasement proposal. Now a united front of official and public opposition stands against invasion of the Park.

English Naturalists

English Naturalists from Neckam to Ray. By Charles E. Raven. New York. 1947. The Macmillan Company. 379 pages. $6.50.

In 1942 Professor Raven of University of Cambridge published a biography of John Ray, in the process of the writing of which he gathered much material on other English naturalists. This material started out to be a series of biographies, but the author found that the lives of these men, and their work, formed a definite pattern, illustrating and illuminating the progressive change in Western civilization from the medieval to the modern world. This pattern is carried out in this interesting and valuable contribution to natural history.

For Fishermen

The Western Angler. By Roderick L. Haig-Brown. New York. 1947. William Morrow and Company. 356 pages. Illustrated by T. Brayshaw. $5.00.

Originally published in 1939 in a two-volume, limited and expensive edition, this book on western trout and salmon reached but a few fishermen. Now, revised and brought up to date, it is brought out in this single volume that will delight all followers of Izaak Walton.

Soilless Gardening

"Success without Soil" is the title of an interesting and practical little booklet published by the Chapman-Gilbert Company, 830 West Ivy Street, San Diego 1, California, and available free from them on request. This company deals in equipment and supplies connected with soilless growth of plants, or hydroponics, but this booklet is not a sales catalog. It provides certain basic practical information that will be of interest to anyone wishing to undertake this method of gardening.

Colorado Leaflets

Two excellent leaflets from the University of Colorado Museum at Boulder have been added to the museums series. These are leaflets 3 and 4, entitled respectivly "Guide to the Lizards of Colorado" and "Guide to the Waterfowl of Colorado." The author of the first is T. Paul Maslin and of the latter Lowell E. Swenson. These are available for fifteen cents each, plus postage.

Fur Farming Fromms

Bright with Silver. By Kathrene Pinkerton. New York. 1947. William Sloane Associates. 347 pages. Illustrated. $3.75.

One of the most famous names in fur farming is the name of Fromm. This is the story of the Fromms, four sons of a large family, who pioneered in the raising of silver foxes, and whose original Wisconsin home is today the largest silver fox farm in the world. This is a story of an enterprise that is typically American, and the author has told it in fascinating fashion. The result is a book that is of wide general interest totally aside from its information on fur farming. And there is a particular interest in this story because it represents a solution of the cruelty and wildlife destructiveness of wild trapping of fur animals. Fromm furs are always marked as being farm-raised, and purchasers may buy them with the assurance that they do not come from animals that have suffered the tortures of the trap-line.

Fish and Wildlife Booklets

"Parker River, A National Wildlife Refuge" and "Federal Duck Stamps" are the titles of Numbers Two and Three in the Conservation in Action series of booklets being brought out by the United States Fish and Wildlife Service. These are excellent popular publications, the former written by Rachel L. Carson and the latter by Edna N. Sater. They are available from the Superintendent of Documents, Washington 25, D. C., for 15 cents each.

IN THE DARK SILENCE OF THE NIGHT

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BELL TELEPHONE SYSTEM

Contents Noted

BECAUSE it comes from a duck hunter, and because it reports practices all too prevalent among duck hunters, we quote from a letter to the editor of *Outdoor Life* and published in that sporting magazine. The correspondent asserts that the so-called possession limit, permitting two daily limits in hand at one and the same time, is one contributing cause of the present duck shortage. "A friend of mine—member of a large California duck club—tells me that members of his club are actually encouraged to take *two* limits each day—as long as they aren't caught," writes this correspondent. "They have a system all worked out. The 'sportsmen' shoot two limits in one day, but carry only one back to the clubhouse. Later in the day, they return to the blind for the rest of the ducks. Then, safely back at the clubhouse, they can claim, if necessary, that they shot *one* of the limits on the preceding day. Even worse than this, I think, is the generally observed practice of shooting as long as the birds are flying, then at the end of the day picking out a 'limit' of the choicest birds, leaving the rest to rot." The writer of this letter asserts that his is not a "crackpot" protest, and that he has seen all these things done. Of course it is not a crackpot letter, and there are few duck hunters who have not seen such practices, yet when people interested in the birds as birds and not targets point out these things they are, to the duck hunter, crackpots.

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THE bluebird family left the nest, but the last youngster to leave was not far enough advanced to fly. Parents and brothers and sisters deserted it, so Mrs. Harold Alsdorf of Wallkill, New York, adopted it, put the cats in the cellar and foraged for food for the mite. Having read in *Nature Magazine* the story of H. Roy Ivor and his bluebird, Bonnie, Mrs. Alsdorf named the orphan Bonnie, and wrote to Mr. Ivor in Ontario for advice on rearing it. He suggested that the bird be sent to his aviary, procuring a permit from the U. S. Fish and Wildlife Service for transportation of the bird. He also wrote to the New York Conservation Department for a permit. The answer was "no." and Mrs. Alsdorf was declared illegally to have taken the bird from the nest. The district game manager would call and collect the bird, the authorities warned. Mrs. Alsdorf called the Conservation Department, explained the circumstances, and was again refused a permit. She was told that she had committed an offense, and rather than do so "should have killed the bird," which, incidentally, was advising her to break the law anyway. The next day the local game officer arrived to seize the bird, which had its own persuasive way, tried to pull out some of the officer's hair and investigated his badge. He ended by reporting the circumstances to Albany and told Mrs. Alsdorf to take the bird to Mr. Ivor. Bonnie, armed with the Federal permit, successfully made her way through Canadian customs and was delivered personally to the Ontario aviary of Mr. Ivor. But Bonnie and her friends certainly left a hopeless tangle of red tape in the offices of the New York Conservation Department. Of course, Mrs. Alsdorf may yet wind up in Sing Sing, and the sensible game officer may have to hunt a job, because, returning after nearly a thousand miles of driving to deliver the bluebird, the Alsdorfs arrived home to find a Federal game warden, sent by the Albany officials, waiting to seize the baby bluebird. Can you top this?

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IT strikes us that it is about time the Congress of the United States showed some concern about the Statue of Liberty. Bedloe's Island, on which the statue stands, is a barren spot, innocent of any beautification. Piers and the retaining wall about the base of the figure are in sad disrepair. Cinder pathways should be paved, and some plantings made. Facilities for the comfort of the public are rudimentary. Mrs. Charles Cyrus Marshall of New York has been fighting an almost lone fight to bring about an improvement, when veterans and patriotic organizations should be carrying the ball. Hundreds of thousands of American boys in uniform, returning from foreign battlefields, have had tears in their eyes and chokes in their throats when they saw the Statue once more. We were one of those, and we shall never forget Liberty looming in the morning mist of an early April day in 1919. We should cherish her as we cherish that for which she stands as a symbol.

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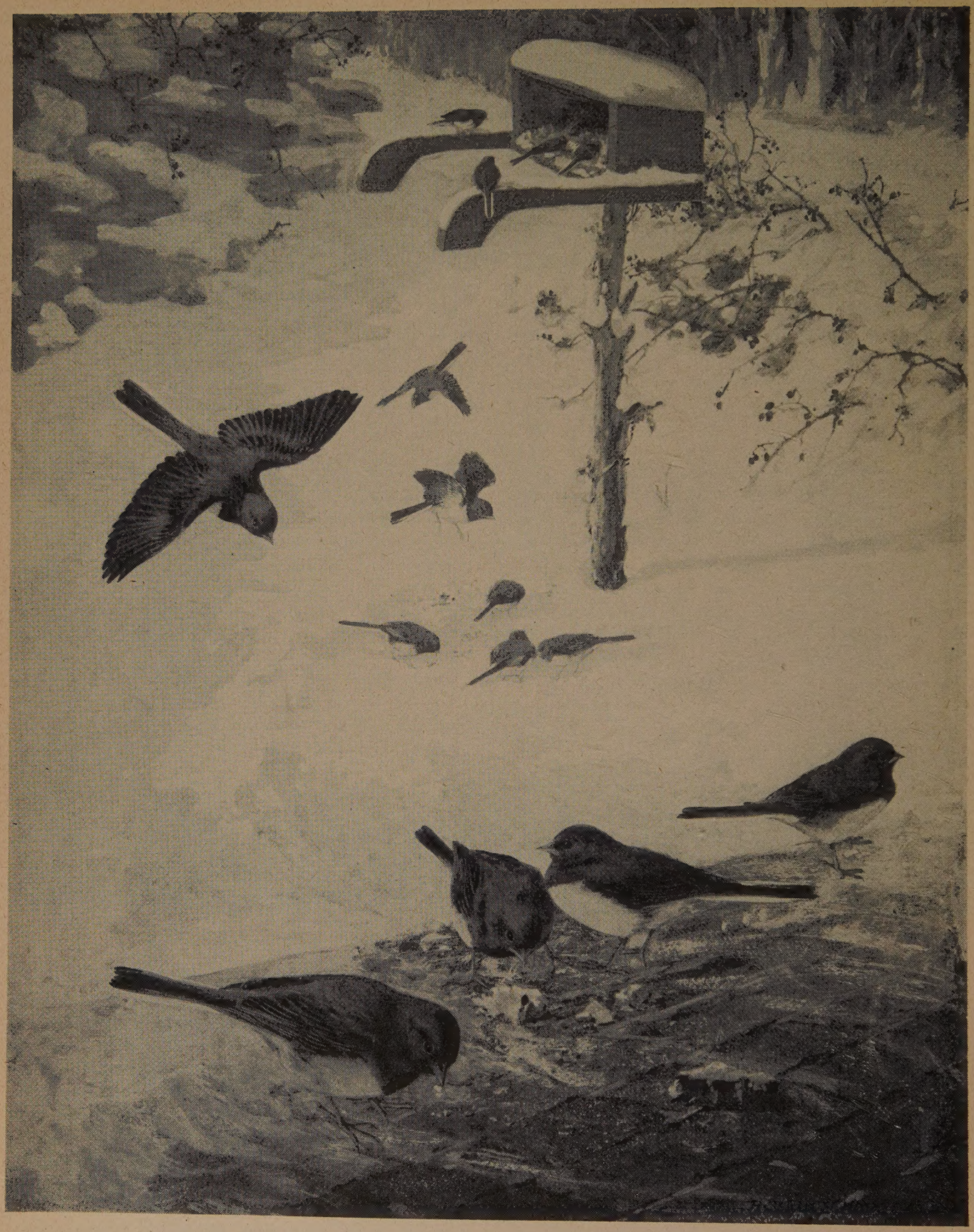
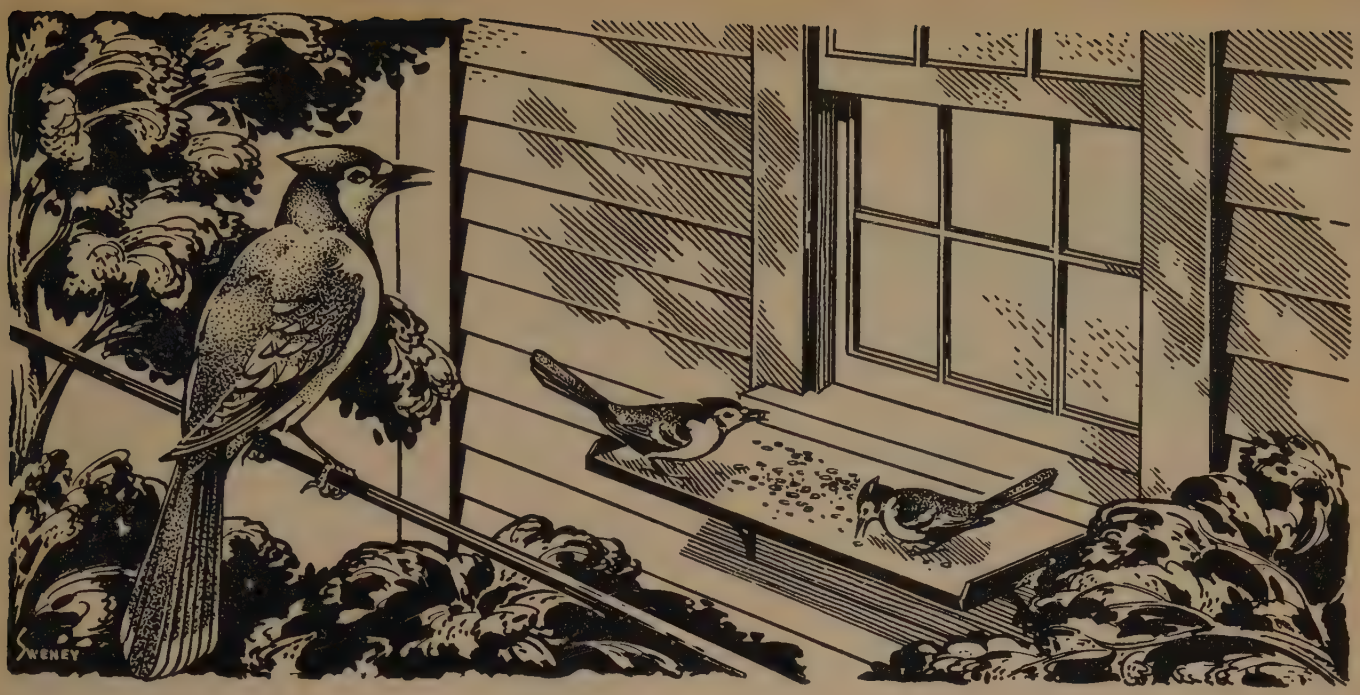
UNDER the sponsorship of The Pennsylvania Roadside Council the 350-mile Keystone Link in the Blue Star Memorial Highway, living tribute to those who served in World War II, will be beautified and protected from disfiguring encroachments. Thus it will stand as an example of proper highway treatment worthy of those to whom it is dedicated. The Pennsylvania State Highway Commission and the Pennsylvania Turnpike Commission are cooperating by assuring the maintenance of the route and its environs. Proper planting, however, is a responsibility of State and local groups, and initial "token" plantings have been made through the Pennsylvania Federation of Women's Clubs and the Garden Club Federation of Pennsylvania. Details as to what must be done may be obtained from Mrs. Cyril G. Fox, R.R. #1, Media, Pa. R. W. W.



Slate-colored juncos at a feeding station, enjoying the bounty provided by human friends at a time when a helping hand is appreciated. This picture was printed many years ago in Nature Magazine, and is reprinted here once more in this anniversary issue. Through the years the magazine has made many friends for the birds.



The Magic Board

By RUTH HOGAN SWENEY

Illustrated by Fredric Sweney

At our house we have a Magic Board. It may look like only a rough piece of lumber attached outside our kitchen window, but it has attracted a score of new friends to us. Every day we watch the birds that fly in for the seeds we put there.

Early in the morning the bluejays post a sentinel on a nearby telephone wire, and at the first sign of seeds this lookout calls the others with a harsh, shrill cry. We have noticed that bluejays seldom crack the sunflower seeds while on the ledge. They take a seed to the fence, and, holding it firmly with their feet, pound the shell open with their long, pointed bills. At the sentinel's signal not only the jays but the inevitable English sparrows come for their share, and then there is a great argument among them, while all the time, high above, the lone jay watches for danger.

Our favorite customers are two families of cardinals. On a cold winter morning, Grandfather Cardinal, who just is not himself in dismal weather, is there before daylight, scolding and fussing if the seeds are not out, hardly able to wait until he can have his breakfast. After he has had a few seeds he speaks much more respectfully to us, but he has no use for late sleepers and tells us so.

The cardinals had not appeared for several weeks until, one fall day, Father Cardinal and a new son were on the ledge. Father would take a sunflower seed in his bill, crack the outside shell and place the kernel in baby's mouth. Evidently Father and Mother Cardinal had explained that we were good friends, for their greedy offspring fluttered his wings and yammered for more as though in the privacy of his own snug nest, while we watched with delight through the window.

One memorable day, not just one but four red-headed woodpeckers had lunch with us. They did not stand on the board as do other birds, but clung to the side, just as they cling to the bark of a tree. Even though we stood in respectful awe while they gobbled seeds, they never paid us another visit.

A sleek little whitebreasted nuthatch is a frequent visitor. He darts in, and, without a glance to right or left, picks up a seed, goes to the edge of the ledge and nimbly jumps off into space. He is a very prudent bird and eats only every other seed. He has shown great ingenuity in finding storage space in the rough bark of nearby trees, under the shingles of our neighbor's garage, and between the crevices of the brick foundation of the house. Absolutely nothing seems to distract him from the business of getting seeds, and you can almost hear him mutter at silly people who waste time looking out of a window as he bustles back and forth. Evidently others have observed the little nuthatch's grace, for I was amused one day to watch a big jay pick up a seed, mince to the edge of the board, crouch down and plunge off in a lumbering

imitation of the nuthatch's dainty motions. It was wonderful burlesque.

Our Magic Board has also given us an opportunity to get well acquainted with Ma and Pa Squirrel, their annual families, and especially their son, Junior, who must be quite a trial to his industrious parents. He spends his time in the winter pretending he is a mole and burrowing through snowdrifts, to emerge at intervals disguised in a snowy beard or wearing a jaunty white cap. Other seasons he keeps himself in trim by shadow-boxing. The squirrel family has a cozy little home high in an oak tree in back of our house, and Ma is a meticulous housekeeper. Like all conscientious homemakers, every so often she just cleans out every nook and corner, and we see leaves and twigs pitched out of the nest with great gusto. When she has completely renovated the interior, she comes down the tree and scouts the ground for fresh, clean leaves and twigs, which she loads into her mouth and tucks under her chin. Then, barely able to stagger under her load, she goes back up the tree. Their home is a good fifty feet from the ground, so, by the time she has made several trips, and has lugged the new furnishings up and rearranged her domicile, she is completely exhausted. We have seen her spread herself flat on a limb, with her legs hanging limply over its sides, there to lie panting and resting for as long as thirty minutes after one of these house-cleaning sessions.

She and Pa keep a sharp eye out for any food available in the neighborhood, and they give the jays a close race to get the seeds first. At one time we had a maple sapling adjacent to our ledge, and the squirrels would scamper up the tree and on to the board. Nothing we could do, not even poking at them with a yardstick through the window, would move them until every seed was gone. In time we became reconciled to this, and allowed for the squirrels in buying our feeding-ledge rations. When we cut down the sapling they were stopped temporarily, but now, on occasion, they will work their way to the edge of our roof by a devious route and drop six to seven feet through space to the ledge, where they land with a great thud. We have quit trying to shoo them away on these visits. By the time they have braved that leap we think they are entitled to a meal.

None of the squirrels let weather interfere with their foraging expeditions. Should it be rainy, they merely hoist their bushy tails over their backs, and, with these as umbrellas, go right along about their business. By the end of an all-day rain they look pretty bedraggled, but even that does not daunt them.

A feeding station does not have to be costly to build or to maintain. With a little ingenuity, and some odd pieces of material, a handy man can build a sheltered feeding spot that will pay off in enjoyment the year around. If you live where the winters are severe, put a roof over your feeder. If you do not have a window where you can attach a board, a three-sided box on top of a pole, about six feet from the ground, will serve the purpose. One of our neighbors has used a discarded garbage can lid as a roof, and the top of a large cheese box, inverted, as a tray, with about a foot of pipe between as a spacer and support. It is suspended from a tree limb on a heavy wire, where it sways in the wind, providing shelter and safety from cats and squirrels. The inverted cheese box lid forms a natural tray with an edge to keep the seeds from blowing off. Look around your garage and in your basement for possible materials, and use your imagination. Let the children get in on the project, too. Building a feeding station with their help will give all of you a lot of fun and satisfaction, and, when you have finished, give it a coat of paint, and you will have as fine a feeder as any you could buy in a store.

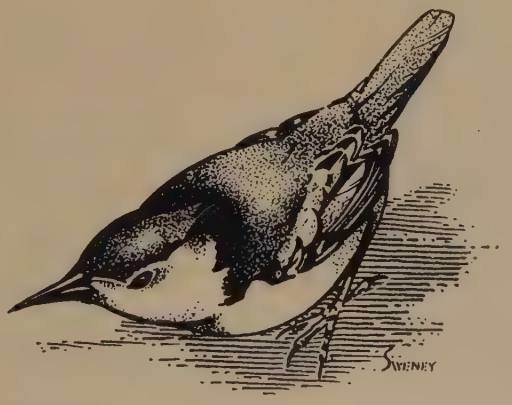
Wherever you live, and whatever arrangement you make, be sure you place your station within view of your favorite window and out of reach of predatory animals. Incidentally, a garage roof is a splendid natural feeding place, and even a board thrown down on the ground and kept well supplied with food will attract the more daring birds.

Leftover bread and pastries crumbled and scattered on your feeder will give you a lot more pleasure than

that guilty feeling we all have when we think we have bought foolishly. Keep a container handy and save the seeds from watermelons, canteloupes, oranges, grapefruit and other fruit. Keep in mind that birds need and like variety in their diet, and put out peanuts and other nut tidbits, peanut butter rolled in small bits, chopped cooked spaghetti or macaroni, and chopped meat and suet. Like most of us, birds like coconuts, but you do not have to bake a three-layer cake for them. Just cut a coconut in half, or cut off the ends, and the birds will pick out their own morsels. Treat them to any winter berries available, and watch them enjoy the bittersweet or other fall berries with which you have decorated your house. The salesmen in seed stores will help you select seed combinations that will attract different varieties of birds to your station. We have found the cardinals, in particular, like sunflower seeds, and will pick them out of any mixture we buy.

Dried bones tied to the trees in your yard will attract the birds, and pieces of suet attached to trees and shrubs will provide food and heat to sustain them in bitter weather. A number of holders that contain suet and seed combinations are on the market, but, if you want to make your own suet bell, attach a wire through the bottom of a flower pot, invert the flower pot in a bowl, pour in melted fat mixed with seeds and nut bits, let this harden, and then hang the bell over your feeding tray.

Birds need water for drinking and bathing, and a flower pot saucer, a pie tin or any shallow container will do. In winter finding water is a real hardship when natural sources are frozen, and, likewise, in summer when puddles have dried up. If you have a bird bath, be sure the water in it is shallow, as birds will not go in water over their knees. It is a good idea to put a flat rock in the middle for the smaller bathers to stand on. A shiny pie tin is a particularly effective vessel for drinking water, as the reflection of the sun on its surface will attract the birds to your yard.



We visited one of the United States Fish and Wildlife Service stations where they "bait" their wire traps with pie tins filled with water for just this reason. The station is situated in a woods quite a distance from any natural source of water, and as the birds fly over they catch the reflections on the pie tin, and, being extremely curious by nature, investigate. As they hop into the wire cage to get a drink, a door is released and they are imprisoned in the cage until they are banded and checked by the station operator. After the bird is identified and banded, it is released, but many of them return again and again to the traps. On this particular trip we had an opportunity really to learn warblers, which are difficult to identify not only because of their size but because of their quick, fluttering movements. There is probably such a station near you, and it would be well worth your time to visit one.

If you have watched birds at all in the spring, you have probably seen a fat robin tugging at the end of a piece of string much too long for him to handle, and have admired his determination to have it for his nest at any cost. If you want some real entertainment, make a mesh bag, fill it with short bits of string or twine, feathers, hairs from your brush, fluff from the sweeper, bits of yarn or any other materials you think the birds would use. Hang the bag in your yard, sit back and watch the fun.

All of us, with one exception, get a lot of pleasure from the visitors to our Magic Board. But we must admit our black cat, who is an important member of the family, has had a bad time reconciling himself to the fact that the birds are not one bit afraid of him. His favorite post is inside the window where our feeding tray is attached. There he sits, with ears flattened, drooling and hurling cat insults at our friends, who pay absolutely no attention to him! It is disconcerting to be a big, vicious-looking black cat and not be able to scare even a little nuthatch. In fact, when Blackie ventures outdoors the birds put him to flight, and he dashes back into the house where he can threaten them in safety.

We wish every shut-in could have a feeding station to watch for the hours of entertainment and pleasure it would provide. We also wish every child could have the opportunity of learning birds at home. There is nothing to equal the glow in a child's face when he finds that a bird or pet has a definite personality. Mr. Turtle, a lamented member of our family whose origin was indeed humble—he came to us from the dime store in a paper

carton—became a neighborhood legend because, after much persuasion and months of stretching his tiny neck and opening and closing his mouth, he achieved the seemingly impossible and "spoke" once, and once only. He achieved everlasting fame on our street by this accomplishment.

Our home is in a typical city residential area, yet from our kitchen window we have seen not only our regular visitors, but flickers, purple grackles, thrushes, brown creepers, pert little house wrens, hummingbirds, Baltimore orioles, slate-colored juncos, ruby-crowned kinglets, catbirds, hairy and downy woodpeckers, and even a mother bob white marshalling her small ones across the street.

A rose-breasted grosbeak serenaded us from our tree with his unforgetably beautiful song, and black and white warblers, Cape Mays, myrtles, magnolias and black-throated blue warblers flit in our trees and shrubs. We have been dazzled by the brilliance of a Blackburnian warbler, a most unexpected visitor in a city. A sparrow hawk spent a day on our garage roof throwing the other birds into a frenzy. A screech owl and his mate call to each other in the night, and one misty morning a Cooper's hawk zoomed low across our yard, with no one contesting his right of way. In the fall, when we hear a sound like small puppies barking, we dash to the yard to watch long, graceful V's of geese going over. So you see it is not necessary to live in the country to study wildlife. Perhaps we get even more enjoyment from observing these gifts of Nature as a break in the rush and hurry of city life. At any rate, wherever you live, country or city, you too can make friends with the birds with a Magic Board of your own, and help the birds by having one.

★

Massachusetts Whippoorwill

By WADE VAN DORE

An engine of song
In the gloom of night
With cylinders that
Are feather-light.

Turned on by the moon,
It might run forever
Did the sun not rise
To pull the stop-lever.

★

Harp of the Desert Winds

By ELINOR HENRY BROWN

Photograph by the Author

Hear the desert, the desert wind coming.
Listen, the wilderness, wilderness strumming.
How the sharp fingers of wind enjoy a
Mad-cap plucking of spiny cholla!

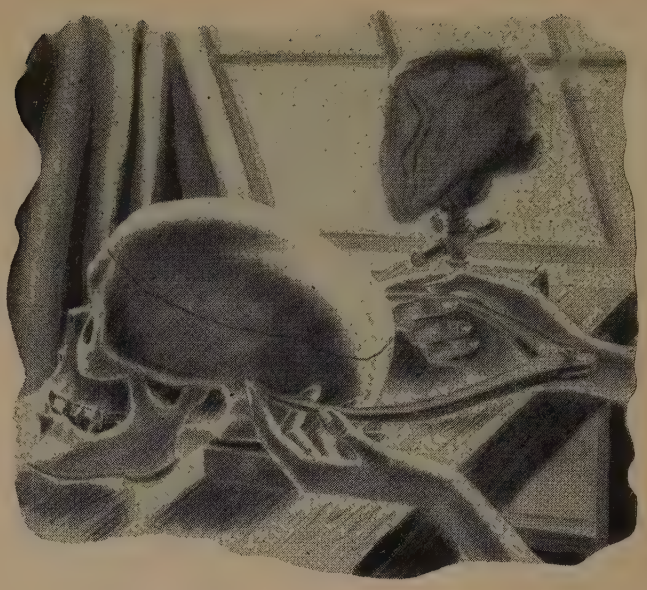
Slide, little lizard, slide and run,
Cool as the music in bone-bright sun.
Hear the desert, the desert wind coming.

White-crowned sparrow on a cactus stem,
Tilt your snowy diadem.
Listen, the wilderness, wilderness strumming.

Ground squirrel, prick your ear-tips high.
What do you hear in the wild harp's cry?
How the sharp fingers of wind enjoy a
Mad-cap plucking of spiny cholla!

The Skeleton Talks

By EDWIN D. NEFF



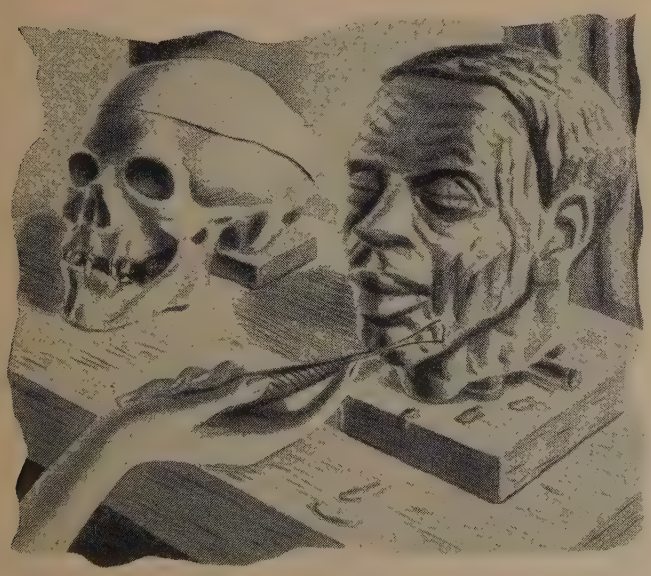
Did you ever hear a skeleton talk? Strange as it seems, they do—to the trained ears of an anthropologist. And sometimes the tales they tell are just as interesting to the police as to the scientist.

Quite contrary to what you may imagine, today's physical anthropologists do not spend all their days dreaming about man's prehistoric dawn. They have done many a job for the FBI—or for police—worthy of telling by an Arthur Conan Doyle. They have sent guilty men to the gallows and freed innocent men after listening to the whisperings of the dead!

Anthropologists can do these things because the human skeleton, or a few bones, or perhaps just a fragment of skull are jampacked with information. True, no such scientist can tell whether a man preferred tea to coffee by looking at his skeleton. But—well, listen to this amazing story of what a trained scientist in the Smithsonian Institution could do with a single charred hand.

This grim fragment was sent to the Smithsonian by the FBI from a Kansas farm, where it had been discovered by a harvester near a barn. Folks out there wondered who had been murdered; so did the FBI. But the anthropologist just sniffed. If the owner of that hand had been murdered it was too long ago to concern the FBI. The hand belonged to an Egyptian mummy!

Then the fun began. When the hand, and the story, got back to Kansas, rural newspapers had a field day. This, they said, was an example of how the big domes in Washington were wasting the taxpayers' money. What business could an Egyptian mummy have in Kansas? Then a little old lady stepped forward with the explanation. The hand did belong to a mummy; it had been brought from Egypt by her wandering nephew and presented to her small son as a souvenir. The son had been tactfully persuaded to keep it in the attic, but some of his youthful friends found it, went outside to play, and lost the hand.



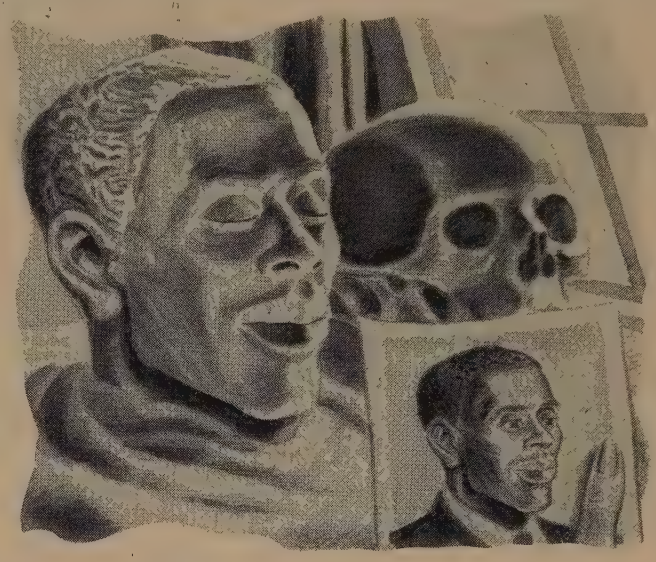
How did the scientists know? First, x-rays revealed human bones. Then the scientists noticed that what appeared to the Kansas eye as charred flesh actually was bituminous remains of an ancient Egyptian formula used in the mummification process. There were bits of textile, too. These were cotton bandages in which the dead Kings of Egypt were wrapped before burial in their gorgeous tombs.

Many have been hanged or sent to jail because they did not know about anthropologists. The wife of a midwestern farmer disappeared quite suddenly, and at about that time the farmer's neighbors began to talk about a big fire he had built in the woods and kept burning for several days. When the police searched the burned earth they found a tiny fragment of bones, but not enough to establish *corpus delicti*. Since no one thereabouts could say for sure whether the fragment was human, let alone a part of the farmer's wife, the Smithsonian was called in.

The anthropologists knew at once the fragment was human bone; that it came from a skull. But this was a tough assignment. Within certain limits, a skull will tell the sex, race and fairly approximate age of the deceased. The male skull is larger, more rugged than the female, with larger brow ridges and larger mastoid processes. A white, or Caucasian person's skull, while more difficult to distinguish than a Negro or a Mongoloid skull, still has certain traits that give suggestions. The nasal structure is more highly developed, with higher roots and bridges, than in a Negroid or Mongoloid skull. The "face" and palate are narrower, and, typically, there is less protrusion of the jaws. The age of any skull is disclosed by the knitting of the sutures, Nature's stitches that hold the skull together. Such "talk" to the anthropologist.

But in the case of the farmer's wife, the anthropologists were on the spot. There was enough skull to be certain it was human; but that was about all. Sex, age and race could not be told for sure. A little police bluffing turned the trick, however. "Okay, Mister," they told the farmer, "the scientists say the skull belonged to your wife and no argument." The farmer confessed and a careful check on his confession revealed it valid.

Given a whole skeleton in good condition, an anthropologist can almost write a book about the owner. Not long ago, workmen found such a skeleton in an abandoned well near Dumfries, Virginia. It was taken to the Smithsonian on the suspicion that it might be the remains of a long-missing Marine from the barracks at nearby Quantico. Of course the Quantico records of physical examinations for the missing man—John Bradford Ellison—were available for a check.



After examining the skeleton, the anthropologists were able to say it was that of a left-handed man, a victim of pyorrhea, who was of such-and-such an age and height and with good military bearing. The records checked perfectly. The skeleton was Ellison's. Shortly after the identification, Ellison's killer was found—the notorious Raymond "Scissors" Saunders, now serving time for homicide.

Pyorrhea, obviously, could be spotted in the dentures, but how about that left-handedness, the military bearing, the age, sex and height? The left-handedness was shrewd guesswork, based on the fact that the left humerus, or upper arm bone, was a bit heavier than the right. The straight, strong spinal column was a tip on Ellison's military career. Sex was established by measurement of the pelvis, and age by the skull sutures and other skeletal developments. Height was easy, of course, since allowance could be added for the flesh that once covered the bones. Actually height can be told with a mathematical formula from a single leg bone or arm bone. The length of the femur, for example, multiplied by 1.880, and plus 813.06 mm., gives the height of a male. A slightly different formula gives the height of a woman.

Scores of other clues are clear to trained eyes when they study a human skeleton. Many diseases leave their traces in the bones—rickets, nutritional deficiencies, arthritic diseases, osteomyelitis, and, of course, fractures and bullet scars, or holes. The various paralyses, mastoiditis, sinusitis also show up. Broken knuckles and smashed nose structures hint at pugilism as a hobby or profession of the original person.

From the skeleton, much can be told of the flesh that once covered it. Dr. Wilton Marion Krogman, associate professor of Anatomy and Physical Anthropology, University of Chicago, has reported an experiment where the procedure went from a known head to the skull, and finally to a restoration of the bust in clay.

To the police, this means that a human skull, perhaps the sole remains of an individual, can be reconstructed so skillfully that it can be identified when compared to a photograph of the individual in life.

Of course, as Dr. Krogman points out, modeling of a head from a skull is not new. Archeologists have often done it to show how a people, long dead, must have looked in the flesh. But Dr. Krogman, in a report to the FBI, believes he is the first to proceed from a known head, to the skull, and "finally to a restoration in the form of a bust modeled in clay." The actual clay modeling was done by Mary Jane McCue, a professional sculptress. She was supplied the skull, and the information that it belonged to an American Negro male, the skull measurements, tissue thickness data and head measurements on American Negroes. With this information she went to work modeling in clay directly over the skull.

The hairline, was of course, a guess, and the ears were difficult, there being no bony structure to guide the sculptress. Miss McCue solved this problem by persuading a kindly Negro janitor in the studio "to lend an ear," figuratively speaking. When complete, the clay bust was instantly recognizable when compared to photographs of the cadaver, providing a grimly exciting moment for the sculptress!

Another anecdote from the files of the FBI discloses the almost fiendish accuracy of the anthropologist. This is the case of "the forest preserve pyre." A few years ago, in the forest preserve of Schiller Park, near Chicago, the badly burned remains of a human were found on a crudely built pyre of burned logs. Destruction was so severe that age and race could not be judged from the soft tissues. The case was turned over to Dr. Krogman. Here is the way the identification was built up, as reported in an FBI law enforcement bulletin:

"1. The dimensions and proportions of the skull and face, together with the general contour of the (skull) vault, indicate a white person. . . .

"2. The size and configuration of the skull, the head of the femur (large thigh bone) and hip socket, the pelvis, all indicate the (Continued on page 50)

Herbs for Use and Decoration

By ANDREW S. WING

Photographs from J. Horace McFarland

Rue, sage and tarragon mingle with apples, quinces, and old roses in this herb garden at Williamsburg, Virginia, where the past has been recreated with consummate skill and beauty.

OUR grandmothers always grew herbs in their gardens, although they may have called them "yarbs". The English pronounce the "h", while we call them "urbs". Whatever the pronunciation, herbs are one of the most useful and interesting groups of plants in the garden.

They are mainly a hardy tribe, self-reliant and unexacting as to soil and climate. True, they prefer a sunny, well-drained slope, and a soil that is slightly on the alkaline side; but they are a thrifty lot and like a soil that is not too fertile, perhaps a bit on the sandy or sandy-loamy side.

What is an herb? Technically, any cultivated plant that dies down in wintertime is an herb—that is, "herbaceous". Regularly, however, an herb usually means a plant that is used for flavoring, for the brewing of teas or medicines, or for fragrance. Those most commonly used are the kitchen herbs, such as sweet basil, sage, dill, parsley, chives, mint, tarragon and thyme. Some garden books, logically enough, classify horse-radish as an herb. Other herbs that are borderline, and that are decorative in a moist, wild garden, are angelica, bergamot, sweet flag, mints, English pennyroyal, snakeroot, valerian and the violets.

The story of herbs starts back in the early days of Europe when monks cultivated cloister gardens. Spices and herbs were prized for seasoning, but spices, including pepper, were an imported luxury that only the rich could afford. So the art of growing and utilizing herbs developed into a near-science that reached its peak in the days of the famous herbalists such as Gerarde. Herbals were the books on botany and gardening written and published before Linnaeus developed the science of botany as we know it today.

Do not make the mistake of thinking that the old herbalists and medicine men were quacks, however. Some of their notions about mixing plants with other ingredients, such as toads' livers and adders' tails, do seem a bit weird today, but modern medicine concedes that some of the old superstitions about plants have a basis in sound medical practice. Foxglove, or digitalis, for one instance, is an old remedy that is still used to treat heart conditions. In Mexico, in the sixteenth century, two native Indians, who had been educated in a Catholic university, wrote in Latin and illustrated in beautiful color an herbal that contains a description of all the plants used in that country for medicinal purposes. This was recently discovered in the Vatican Library in Rome, and was reproduced in color at private expense in the United States. This was the Badianus manuscript, and I consider myself fortunate to own one of the copies offered in the limited edition. This work speaks eloquently of the great value placed on

Chives are one of the most satisfactory of the kitchen herbs. They are long-lived and they multiply. Also, their pale lilac flowers have decorative value.

Lavender, as one of the fragrant herbs, has always been a favorite. It is easy to grow and is worth having, along with other oldtimers among the herbs.

Sweet basil is almost a "must" in any herb garden. It is easy to grow and is clean and beautiful in the garden. A short row of these plants is enough.

herbs and other useful plants, both in the New World and the Old. Indeed, the old Spaniards were just as eager to dig up new and useful plants as they were to discover gold.

Today we use plants for what they can do for us as food and for their beauty, rather than to cure our aches and pains. Most gardeners are interested only in plants that beautify their gardens, or that satisfy their taste buds. The common herbs do both, although their beauty is usually more or less on the quiet side.

If you wish to plant an herb garden and if your place is small, you might set aside a small plot on the sunny side of the house, provided it is well-drained, not subject to overflow from the eaves, fairly well supplied with good soil, and not crowded with other plants. In a space two feet wide by ten feet long you can grow all the herbs needed in a season by the average family. These would include chives, parsley, mint, and sweet basil, with perhaps a few other kitchen herbs tucked in. One of the secrets of success with herbs is to grow them with open spaces between plants. Those with invading habits, such as the mints, should be restricted by means of dividing strips of sheet iron, old auto license plates, or tarred paper set in the ground with only the top edge protruding. The shallow-rooted, low-growing plants, such as the creeping thymes, may be used effectively in the rock garden, or for ground cover in any dry, sunny spot. Crocuses and other small bulbs can be planted underneath with no serious interference from either group of plants.

Horehound makes an interesting and attractive plant and it is, perhaps, best known for its use in candy.

In earlier days a common but charming practice was to plant herbs in small, formal beds arranged in symmetrical patterns. This custom is carried on today by those who like the traditional in gardening, or who prefer neatness and a regular pattern to casualness. The plants will do equally well in straight rows

or spotted here and there in an informal plot. For purposes of identification, as well as design, a little law and order is sometimes a good idea in the herb garden as well as in the formal border.

Always keep in mind that some herbs are hardy perennials, while others are annuals or biennials. You need have no fear about the mints perpetuating themselves, and that includes beebalm, or Oswego tea, and all the other members of the mint family. Some multiply much faster than others, it is true, but most of them are everlasting once they are established. Chives are equally long-lived. A single clump, purchased at the corner grocery for a quarter or so, will in a few years supply enough plants to make a border around your herb bed, or along your garden path, provided, of course, they are divided regularly. The decorative value of a row of chives, with their pale lilac flowers, is not to be underestimated. And how good they are in salads, or mixed with a soft cheese!

After caraway's white or pinkish blooms turn to seed it yields the product for which it is widely known.

Parsley is a biennial, but is best treated as an annual. The seed is slow to germinate and somewhat uncertain, so sow it early and rather thickly, using fresh seed. Most men wonder why their wives sprinkle parsley on potatoes. Parsley in the garden is decorative, and it is useful, either fresh or dried, in soups, salads and other dishes. But why annoy the male with parsley on potatoes? The ladies will have to answer that one.

Sweet basil is an annual, easy to grow, clean and beautiful in the garden and indispensable in the herb cabinet. A short row will provide enough dried leaves to last several seasons. It takes only a pinch of basil, or of most other herbs, to give a dish that certain something that herbs alone can provide. You can use sweet basil in vegetable soups, stews, omelettes, and tomato dishes, but do not overdo it. To me, however, this is the (Continued on page 48)

Thyme is one of the kitchen herbs. It is grown both for ornament and for its aromatic foliage, which is used in flavoring. Oil distilled from this plant is sometimes used in perfumes.

Sage needs no introduction to any user of herbs, and is specially favored at turkey time, when no dressing would be complete without it. Decoratively, also, it has its place in any garden.

Helium, the Mighty Nothing

By EUGENE W. NELSON

★

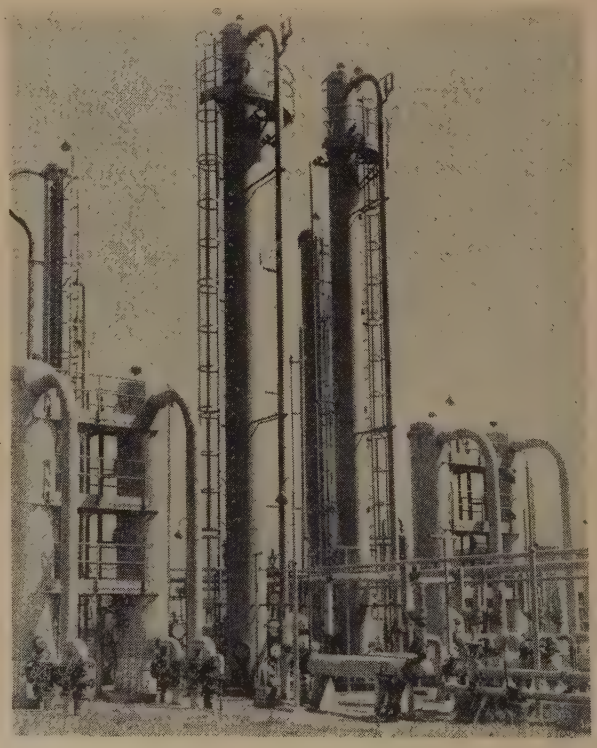
An operator using a "Heliarc" torch while welding magnesium. The flow of helium prevents the magnesium from bursting into flame during the welding process. The chain holds the sheets of magnesium in place.

LET us go back in time to the year 1903, and travel to the little town of Dexter, Kansas. Could you thus turn back the clock you would find hundreds of people from the town, and from the surrounding farms, milling about at a respectful distance from a solitary figure standing beside a wooden framework supporting a jumble of pipes and valves. There is an air of great expectancy hovering about the crowd. There is good reason, too, for on this day the first natural gas well is to be opened in Dexter. And everyone knows that natural gas will bring prosperity in its wake, as it already has to other lucky areas. Fittingly to dedicate the new well, its owner is going to light it with a flaming torch!

The valves spin, the crowd roars, then their cheers turn to groans. The blazing torch, thrust into the very heart of the rushing gas stream, has gone out as if doused in water!

Months later, the Chemistry Department at the University of Kansas explained why the Dexter celebration had turned out to be such a monumental flop. Their gas would not burn because it *could not*, since it contained more than 80 percent of nitrogen and other inert gases. The University chemists also announced that the Dexter gas was unique in that it contained 1.84 percent of helium, the most inert gas known to science. This latter news excited scientists in all parts of the world because this was the first time that helium, the future "miracle gas", had ever been found on our earth. It is doubtful if the citizens of Dexter appreciated the honor, at that time.

Although helium had been unknown to the people of Dexter, it had been known to the world of science ever since 1868. In that year, the great British scientist, J. Norman Lockyer, had made an intensive spectroscopic study of the sun. He found a spectrum line never before recorded, and promptly named the new element "helium" from the Greek "helios", meaning "sun". It is quite probable that the famous astronomer never had the slightest idea of the many uses to which his "sun element" would some day be put.



Heat exchangers, reboilers and columns of the carbon-dioxide removal equipment at an American helium plant.

Although the world of science was excited about finding helium in the Dexter gas, the world of commerce paid little if any attention. There was just no use for the gas in those days. In fact, by 1917, when our country entered World War I, there was only one cubic foot of the sun element in existence. It had been produced in the laboratory, and at a cost of $2500! Because helium is nearly as light as hydrogen, but will neither burn nor explode, the Allies became greatly interested in the new element for use in lighter-than-air craft. An intense search for helium supplies was staged, and new

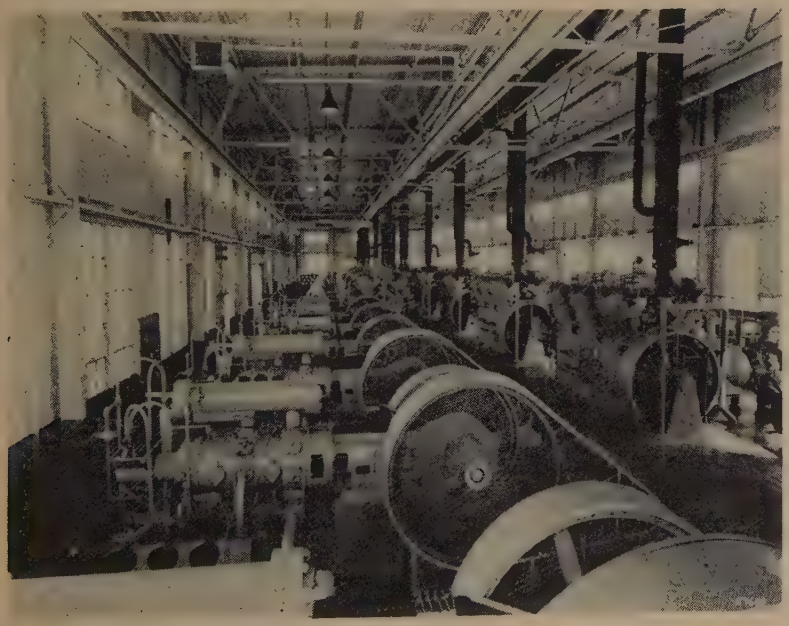
methods of obtaining the gas were perfected. As a result of this two-way effort, there were 147,000 cubic feet of helium on the New Orleans docks ready to be shipped to England when the Armistice was signed. That gas had cost a mere half-dollar per cubic foot.

Since that time, a plentiful supply of helium has resulted in many new uses being found for it, both in war and in peace. Today the gas, which not so long ago was known only as an element existing in the sun, is finding important applications in deep-sea diving, medicine, metal working, and aviation. But, before we see helium at work, let us take a quick look at the gas itself and see just what properties make it so valuable, and, also, how the gas is obtained in large quantities.

Science often refers to helium as "our mightiest nothing" because helium is tasteless, odorless, colorless, non-flammable, non-explosive, and non-poisonous. It weighs about one-seventh as much as air; has the power to seep into places where other substances cannot go; is so inert that it will not combine with any of the other chemical elements. In fact, helium may be described as "non-everything." But it is just this "non-everything" property that makes the gas so useful.

The refining of helium today is a fairly simple process, provided, of course, that the almost completely automatic separating equipment and refrigeration system used in the process is taken for granted. The natural gas containing the helium is piped from the wells into the separation plant. Here it is washed chemically to remove the carbon dioxide. The cleaned gas goes into the pipes of the refrigeration system and is cooled to 300° below zero Fahrenheit. This liquefies all the gases except helium, which is removed in the gaseous form from the main body of the liquid. The helium is shipped in steel bottles or special tank cars, and the remainder of the natural gas is sold to gas companies. The "de-heliumized" gas is slightly better because the non-flammable helium has been removed. At present, helium costs about one-half cent a cubic foot.

No other country but the United States has ever located gas bearing an appreciable amount of helium. Latest Bureau of Mines estimates, however, place our potential supply at well beyond ten billion cubic feet, enough to last us for quite a while. The Bureau of Mines owns a lease on rich helium gas acreage in the Rattlesnake Field near Shiprock, New Mexico; two reserves totalling 16,000 acres in Utah; and the 50,000-acre Cliffside field near Amarillo, Texas. The gas from the Rattlesnake Field has been found to be far richer than the others, having a 7 percent helium content, while the average for the other fields is 2 percent.



An airplane view of one of the helium refineries, and, left, an interior view in a helium plant, showing a partial view of one of the batteries of compressors that turn the gas into liquid.

Helium's three outstanding virtues—its lightness, its inertness, and its non-poisonous characteristic—are giving it great possibilities in modern medicine. In fact, nearly all of our first-class hospitals today are well supplied with tanks of the "miracle gas."

Certain anesthetics used in operations are highly flammable, even explosive. People have died on the operating table because of the explosion of an anesthetic in their lungs. A mixture that cannot explode and kill, made by adding a sufficient quantity of helium to the anesthetic, eliminates this danger. Moreover, the light helium mixture has the ability to go into every nook and crevice in the lungs

of the patient. Then, when it is exhaled, it brings out a portion of the anesthetic that might otherwise linger in pockets, causing serious after-effects.

Helium has also saved the lives of numerous people who suffered from severe cases of asthma. A victim of this disease can take a few whiffs of a mixture of oxygen and helium and obtain almost instant relief. This is because helium is so light that the muscular effort required to breathe it is only about one-third that needed to breathe ordinary air. For this reason, helium is the ideal gas to carry the life-giving oxygen through human air passages clogged by asthma. Of course, the helium-oxygen treatment should be given only by a competent physician.

This "mightiest nothing," combined with oxygen, had an adventurous wartime role in deep-sea diving and in rescue work. By breathing helium and oxygen, men are now able to walk in safety on the ocean floor at a depth of 600 feet. Laboratory tests indicate that some day this depth may be doubled. Before the advent of helium gas, however, 300 feet was about the limit to which divers could descend with safety. Their stay at that depth was limited to a few minutes.

Now, with the use of this "synthetic atmosphere," a good diver can work for six hours at a depth of 300 feet, and for shorter periods at 600 feet, without any ill effects. It is easy to see what this will mean in the attempts to salvage wrecked treasure ships lying on the ocean floor at depths hitherto impossible to reach.

The role of helium gas in permitting divers to work at such unheard-of depths had been carefully studied. When a diver is breathing ordinary air, while being subjected to the great pressures encountered several hundred feet down, he is liable to suffer temporary lapses of memory. His mind remains perfectly clear, however, when breathing helium and oxygen. Helium also reduces a diver's chances of getting "bends" when returning from the ocean floor to the pressure of our normal atmosphere. "Bends" is caused by bubbles of nitrogen popping out of the diver's blood as the pressure on him is reduced, and then collecting in the diver's joints. In the helium-oxygen mixture, helium replaces the nitrogen and is much less apt to cause these destructive bubbles.

Of course, a lot of helium was used during the recent war for filling lighter-than-air craft. Although a large blimp of the type used to guard convoys requires 6,500,000 cubic feet of helium, American production of this "nothing" gas was so rapid that, shortly after Germany began blasting our sea-going shipping, the Navy had whole fleets of helium-filled blimps in the air. These sausage-shaped balloons did a wonderful job of searching out enemy submarines and destroying them. In fact, it is a matter of record that not one of the thousands of blimp-escorted ships was sunk by an enemy. This was due to the fact that blimps can fly slowly enough to keep pace with a slow-moving convoy. Helium gas made the blimps safe to operate from the crew's standpoint, a hydrogen-filled balloon being more of a danger to its crewmen than it is to an enemy.

Another use of helium in the general field of flying is in reducing the weight of air liners. Experiments conducted by Consolidated-Vultee Aircraft Corporation showed that a saving of 180 pounds could be effected when helium was used in place of air to inflate the tires of one of its large liners.

Helium has proved to be of tremendous value to United States weather men by lifting observation balloons. Many weather stations have had to be moved to air fields with the great advances and expansion in aviation. Sounding balloons carry meteorological instruments high into the air in an effort to gather the information from which valuable long-range forecasts are made. Use of explosive hydrogen around airports is extremely dangerous. In the picturesque language of the pilots, however, helium is "as safe as a baby's breath."

During the war, aircraft designers made life miserable for the metallurgists with their constant pleas for lighter, stronger metals. The object, of course, was lighter and safer planes. The metallurgists responded by giving them vast quantities of the "mermaid" metal—magnesium.

Magnesium, however, although practically the answer to an aircraft designer's prayer, bursts into flames when touched with a welder's torch, and modern aircraft parts are usually joined together by welding. So, a special welding torch was designed to permit aircraft manufacturers to take advantage of the light magnesium alloys and the fast method of assembly by welding.

This welding torch includes a hollow handle and a nozzle through which a steady stream of helium is spirited over the surface of the magnesium metal as it is being welded. The helium, being inert, forms a fire-proof blanket around the metal as it melts during welding and keeps the magnesium from catching on fire. In this way, helium (Continued on page 50)

Long Encampment

By JOHN GALLINARI WHIDDING

The wind has fanned the ember stars to flame,
This gusty night. The deeps of heaven glow
With sentry fires that flared before we came
And, burning yet, shall guide us when we go.

The night-sky is a field where, after rout,
In long-gone years some battle-wearied men
Made bivouac, stacked arms, set sentries out
And fell asleep—and never woke again.

Still blazing when the wind assails the plain
Where wakeless slumber holds in lovely thrall
Time's dreaming host, night's ember stars maintain
The long encampment that awaits us all.

Bigleaf mistletoe from a California juniper, the kind usually sold by vendors of Christmas trees in California.

Mistletoe, Prized Pest

By LESTER ROWNTREE

Photographs by the Author

I HAVE always felt sorry for mistletoe as well as for the tree or shrub that has to carry it. It must have been a sad comedown to be demoted from the Druidical status of sacred eminence to a semiparasitic shrub used commercially for the pampering of sentiment. In States where mistletoe is not native, its appearance is made only once a year when, in December, shipped-in branches are placed in advantageous or artfully concealed positions. If, come Twelfth Night, these and other Christmas greens are not burned, the tidy elves, which, according to legend, watch such doings, take their revenge.

The mistletoe worshipped by the Druids—the kind that at Christmas decorated my girlhood home in England—is *Viscum album*, a native of Europe and Asia. It has the customary thick, leathery pairs of yellow-green leaves and large waxy white berries. The mistletoe of eastern markets is *Phoradendron flavescens*, and is stripped from trees native to southern and middle-eastern states. The leaf is broader, and the berries, which are borne in closer bunches, are smaller than on the mystic "celestial tree" of Europe.

There is nothing hallowed about the mistletoes of the southwest, and no one treats them with the least respect. They are ever-present, two of the twenty-one mistletoe genera and thirteen of the six hundred species. The mistletoe usually sold by Californian Christmas tree vendors may be bigleaf mistletoe, a variety of southwestern *Phoradendron flavescens*, or it may be common mistletoe, *P. villosum*, both with white berries and probably lopped off from tall cottonwoods. They are lumped in piles beside the cut Christmas trees; like the trees they get drier and drier, and, on Christmas eve, what remains on the wilted heap is sold for a tenth of the original price. Never have I seen the delightful, pink-berried mistletoes offered for sale.

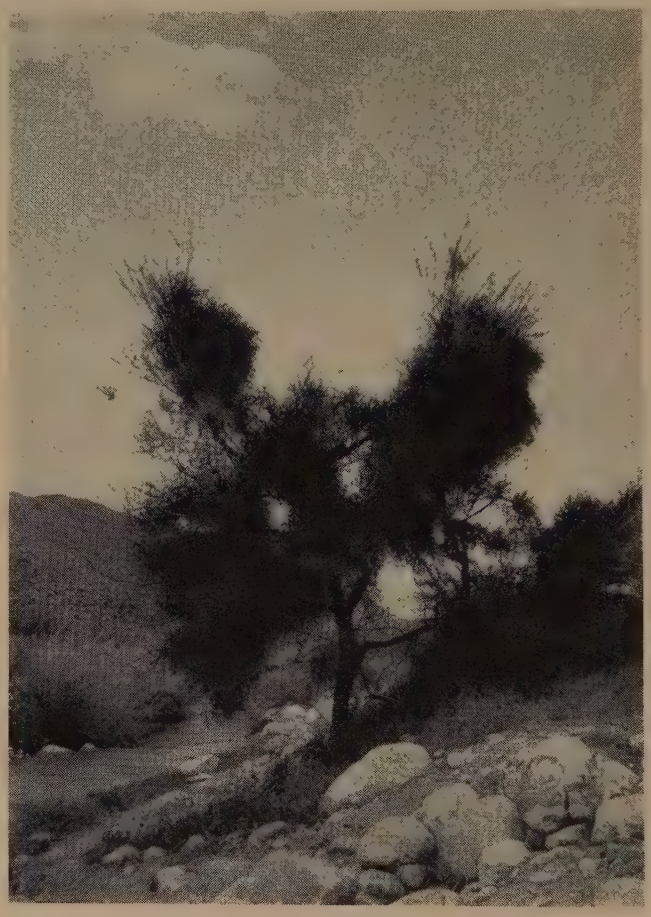
Bigleaf mistletoe is the one that forms clumps as large as eagles' nests, and infests sycamores and cottonwoods in warm sections. The trees follow the beds of dry washes, and their roots penetrate deep into the sub-moisture. If we have had normal rains, it is fall before the cottonwood leaves go yellow, and it may be early winter before the dark mistletoe bunches are silhouetted against the sky. They stand out in contrast to the light cottonwood branches and look almost black above the pale trunks of sycamores, dappled with white, gray and tan. In many places, notably along the Ridge Route, which winds south across the Tehachapi Mountains at the south end of the San Joaquin Valley, this semi-parasitic shrub invades the willows, and I have seen it chunk-up the handsome forms of silvery buckeye, *Aesculus californica*, mar the smooth symmetry of alder, clutter the boughs of canyon ash and of wild walnut.

In central California, up the west openings of Coast Range canyons, fog comes in from the Pacific and, en route, drapes the dark, coast liveoaks with wisps

of sea-green lichen resembling the "Spanish moss" of Gulf coast trees. The sun of valleys to the east flows down the other end of the canyon to eat up the fog, and where there is still fog enough for fungus and heat, and fertile soil enough for valley oak, *Quercus lobata,* these noble trees, with lobed, deciduous leaves and slender-pointed acorns more than two inches long, are burdened with common mistletoe as well as with lichen:—"Overcome," to quote the Bard, "with moss and mistletoe." In winter these oaks and their plagues stand out between hilltop and a sky that is glorious at dawn and painted, at evening, with sunset shades. By day the living nests glitter a golden yellow in the sun, and the lichen floats like silver gauze, but at night both look dark and forbidding even in moonlight.

The berry clusters of common mistletoe are shorter than those of bigleaf, and its leaves are not so long. This is the mistletoe that clings to two deciduous mountain oaks, blue oak, *Quercus douglasii,* and Kellogg oak, *Q. kelloggii.* Blue oak is a tree of the higher foothills, and at about two thousand feet it overlaps Kellogg oak, which goes on up into higher altitudes. Mistletoe is not conspicuous on blue oak, for this tree is late in shedding its gray-blue leaves. Snow will have fallen and deer hunting season may be over before the blue oak is denuded enough to expose its hanger-on. In early spring, just as the mountain passes begin to open, and the thick, scarlet stalks of snow plant are pushing up, the new silver and pink foliage on Kellogg oak is at its loveliest, and the muddled masses of common mistletoe are a sorry sight among the tender spring leaves. In the coastal hills of San Luis Obispo County, where December winds blow strong, the cottonwood branches, bereft now of foliage, disclose their load of this pesky adherent; the branches jerk sharply in the gale and become scrawny arms as if trying to shake off a molestation of mammoth bumblebees.

In the Kellogg oak zone another mistletoe, *Phoradendron libocedri,* has invaded the incense cedars. It is a much-branched species with white berries and scale-like leaves on the short-jointed side branches of drooping stems. White fir has its own mistletoe, and, belonging to another genus, are five mistletoe species growing on conifers. The berries on some of these have a transparent tinge, and all of them have inconspicuous leaves that look more like scales. Even stalwart Sierra juniper, which braves the most punishing storms, but remains standing like a sentinel against the glistening white of granite mountain sides, has its mistletoe. No mistletoe can control this giant as it can the cottonwood or the mesquite, for it must always take second place. It grows in small, drooping clusters along the branches, looking very yellow among the dark foliage and against the red bark, and is tolerated with amused forbearance. It is the same pink-berried species that inflicts itself on cypress trees, on pinyon pine and on the desert juniper.



A mesquite bush burdened with the parasitic growth of the mesquite mistletoe.

The desert mistletoes are the ones I have had the most fun with. There are two reasons for this—they grow on shrubs, and instead of having to shoot them down I can jump for them, and I can do entertaining things with brilliantly colored berries. Where the desert is lifted to meet the hills, which hold the summer's heat and the winter's snow, slopes of glittering chrome are dotted with the rounded forms of desert juniper.

Juniper californica is a shrub that, in good fruiting years, sparkles with silver fruit. Often there are dramatic granite boulders close by and from one of them a gnarled, old, gray-barked pinyon may cut the heavy blue of the desert sky. Verdin, a mere handful of yellow and gray, is busy in the bushes, and fly-catching phainopepla, black and white and crested, suddenly flies up from a juniper and as suddenly drops back. The juniper, whether it likes it or not, must often become the patron to *Phoradendron densum,* whose thin leaves are short, narrow and bright green, and stand up like pairs of listening ears on a small animal. The berries are little pearls, plump, clustered, built to scale and with all the translucence of a mistletoe berry plus the pink of the inside of a shell. This is the mistletoe I like best for decorating, for it has striking beauty against juniper foliage, with white berry-like cones, and against the dark green of short-

needled pinyon. I like to cut a whole hunk from the enlarged knuckle of the shrub, with just enough of the host tree to hang on a door knocker, knowing that while pleasing the bush by the removal I also make a friend's Christmas the more festive. At this time the berries are usually some good shade of pink, but after the turn of the year they darken, go deep red and finally lose much of their iridescent charm.

The mesquite is one of the desert's most common bushes. There are two mesquites, both spiny and with deciduous bipinnate leaves. The bean-like seed pods of honey mesquite are straight, and those of screw-bean mesquite are curled into cylindric bodies like the dandelion stems, which, when we were young and gay, we shredded and soaked into curls. Mesquites are untidy bushes, but when they become heavily burdened with *Phoradendron californica* they are disreputable in the extreme, and look as though an invasion of wood rats had set up housekeeping in them. At last they succumb to the ravages of the robbers and flop to the ground where they are no longer inhabited by birds but by small creatures of the earth. In detail, the mesquite mistletoe is an exquisite thing. Its leaves, which resemble scales, hardly enter into the picture, and it is the berries that give it grace. These are borne so profusely that the inner jumble may be hidden, surfaced with a veil of rubies. The berries are small, numerous and strung tightly along short side spurs, which stick out in pairs from the otherwise naked stem. As with all desert plants, the sun has a lot to do with their development; lift the veil and you will find its under side quite green. Under the influence of sun and cold—for the desert can be very cold—berries go from pink to red, and stems from green to red, so that by Christmas they are both the same color.

When you see the number of berries and the powerful mass one berry can produce, you wonder why mistletoe is not even more devastating, for, after all, the percentage of increase is small. It is interesting to watch the process of mistletoe seed distribution, but it is a time-absorbing job, since much of it is done by birds and bird-watching takes time as well as patience. In winter mistletoe berries are prime and other bird food is scarce. A red-breasted linnet comes to the mistletoe and flies off to another bush, its mouth full of berries; a phainopepla comes to help himself and moves off with his catch. Sometimes he sits on the tip of the shrub to which his larder is attached. Many birds have a favorite perch and return to it again and again. In this case the excrement piles up in the same spot, and makes mistletoe growth impossible even though germination occurs.

Those who must do their own clearing away after putting up the Christmas greens are all too familiar with the glutinous substance that surrounds mistletoe seeds. The berry is at its stickiest just when it is loveliest, and it has injected a clashing note into the merriment of many a Christmas eve by falling and being trod upon, or working its gooey way deep into the nap of a favorite rug. This mucilage is one of mistletoe's insurances of life, for it causes the seed to cling to the coats of animals and to the bills of birds. The animals wander off quite unconcerned, but a sticky bill irritates a bird and he may go to the branch of a neighboring tree to rub his bill clean. The bird leaves but the mistletoe seed stays and has a good chance to dig in and form those specialized roots called haustoria. The seed that sticks to the coats of rodents and other furry beasts, and those that have been eaten by quail, do not often lodge on a bough and soil is unacceptable to mistletoe. Those that are dislodged from the bills of birds may drop on a dead branch but will die.

If you stay on the job long enough you soon see a gesture of rebellion on the part of the host. That part of the trunk into which the mistletoe seed roots have penetrated emits its own gummy substance, which in time hardens and breaks off, taking the intruder with it to the inhospitable ground. This does not always happen, and it is quite likely that the persistent filaments of the embryo make connection with the inner bark, begin to take up moisture, establish toe holds and launch into swift maturity, justly earning the name of *Phoradendron*, which means "thief of the tree." During its lifetime mistletoe depends on two sources for food. Through its stems and leaves it takes carbon dioxide out of the air, and from its host it helps itself to mineral salts and sap—which puts mistletoe more or less in the same class as the sapsucker. As the young semi-parasite strides ahead it sends out many pairs of green, branched forks, and as these grow the branch on which the designing plant is lodged develops an arthritic-looking knuckle (Continued on page 50)

The Fur Coat

By LEAH BODINE DRAKE

I had a queer thing happen once,
(The girl in beaver said)
I had this coat on—new, it was—
When I knew a sudden dread,

A wild despair there on the street,
And pains shot through each wrist
Like burning pincers. . . . I smelled blood. . . .
My mouth was dry with thirst.

And then I screamed . . . but no one stopped
To turn a startled face;
And yet I seemed to scream and scream
Alone in some dark place!

But the worse part of this strange affair,
Just as it passed (she said),
I felt as though I was this fur
And I were dying . . . dead!

Billy Sheffield and "Buck" in "A Boy and His Dog", a Warner Brothers' short subject. "Buck" played the part of "Fleta" in the film "Sergeant York", and has had other motion picture successes, just by looking natural and appealing.

Dog-Pound to Kleig Lights

By GRACE V. SHARRITT

He was just a hound dog; a good for nothing hound dog, at that! He would not chase a rabbit. He cared not at all for birds, although he was bred to hunt. So his owner disgustedly turned him over to a dog-pound in Van Nuys, California. That was some years ago.

One day, a movie scout was searching for a hound to be tried out as a hunter. His shrewd eye picked out this photogenic canine. The dog was taken to a hound kennels. But still he proved no hunter.

"He isn't worth his salt," his trainer opined gloomily. "Take him back to the pound."

However, Rennie Renfro, who furnishes many dogs for motion pictures, was looking around at the particular time for a hound for the picture, "Sergeant York." He liked the unwanted hound's appealing look. And the dog which did not care for rabbits or open fields responded to footlights and a theatrical stage like a veteran Barrymore! Thus did Fleta become a famous canine star.

He was a natural! He had box-office appeal! His hit in "Sergeant York" was followed by other successes, including "Swamp Water," and a lovely short called "A Boy and His Dog." He was by way of becoming a gold mine to his new owner. Then came conflict and trouble! Suddenly the dog who was not worth his salt, and whom no one wanted, was worth his weight in good American coin, and a prize that everyone wanted! Even his old owner wanted him back!

There were troublesome lawsuits. Charges were brought against the studios. However, the cases were blocked by demurrers and the controversies ended.

Fleta has not been spoiled by this rags-to-riches life. He is getting up in years but he thrills to the excitement of "shooting" a picture, in which he can play hero. All he does is look natural in a scene, his big brown eyes pleading to some boy or man. As a heart-tugger, his future is bright, and embroidered in comfort. He has completely forgotten his ignominious dog-pound past.

Which all goes to prove that anything can happen to anyone, even a hound, in Hollywood!

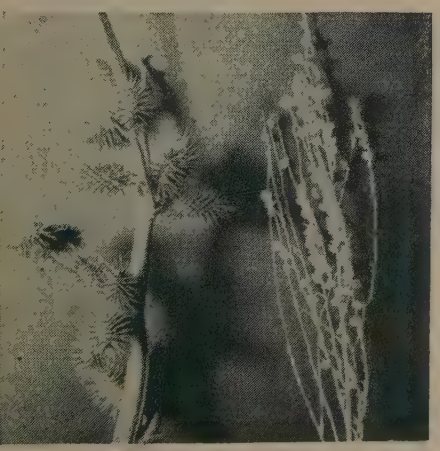
Winter Skeletons

By CRAIG BURNS

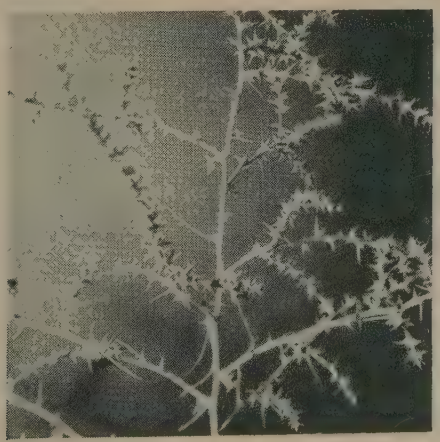
TO the casual wanderer in the fields, one who lacks the seeing eye, the winter countryside may seem to be bleak and uninteresting. Yet there is still much of interest, for the dry, brown stalks of plants more cherished in summer, with their withered leaves, seed pods and burs, may be found in the sere fields or projecting above the snow. These might be called winter skeletons. Identifying them adds much to our knowledge of plants.

On these pages are pictured the remains of many wild plants collected in Colorado during a winter of roaming the fields. Similar collections may be made in other parts of the country, adding greatly to one's botanical lore learned in the growing season, and to the interest of a winter walk. Some of the "skeletons" found may be easily identified by their special characteristics, such as the square stems of the mints, the odor of the sage when crushed, or the gummy consistency of the gumweeds. Of course, these qualities cannot be pictured, but they can be learned along with other features of the plants. On your next cold-weather walk see what you can find above the snow—and recognize.

Cocklebur is distinctive, and mountain sagebrush, when crushed, identifies itself by its odor.



Russian tumbleweed, a thistle, is a many-branched dweller of sandy plains, turning purple in fall.



Leafy cinquefoil, left and right, and a "skeleton" with the seed pods of blue flax in winter.

A twig of pussy willow with its promise of spring, and the characteristic pods of milkweed, are winter "skeletons" that almost anyone should be able to recognize.

Twigs and seed pods of wild cucumber, or wild balsam apple. The spiny and papery pods are more conspicuous than is the fruit of many another weed one will find in winter.

Seed pods of bush morning glory beside a dried twig of dock. Below is another specimen of leafy cinquefoil, a twig of poison ivy with berries and a delicate twig of harebell, whose bell-like flowers in winter are only reminders of summer charm.

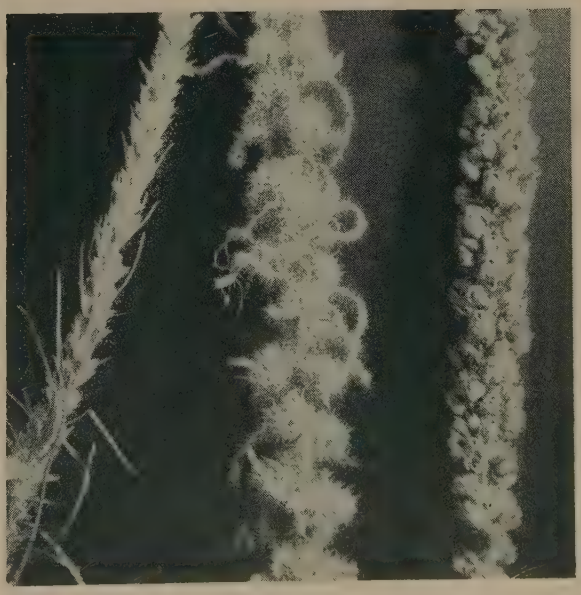
Prickly poppy is a common and distinctive plant, and, next to it, yucca leaves a "skeleton" easily identified. Below, gumweed, noted for its stickiness. Its flower rays remain on the plant after blooming. It is a rather coarse plant easy to identfy.

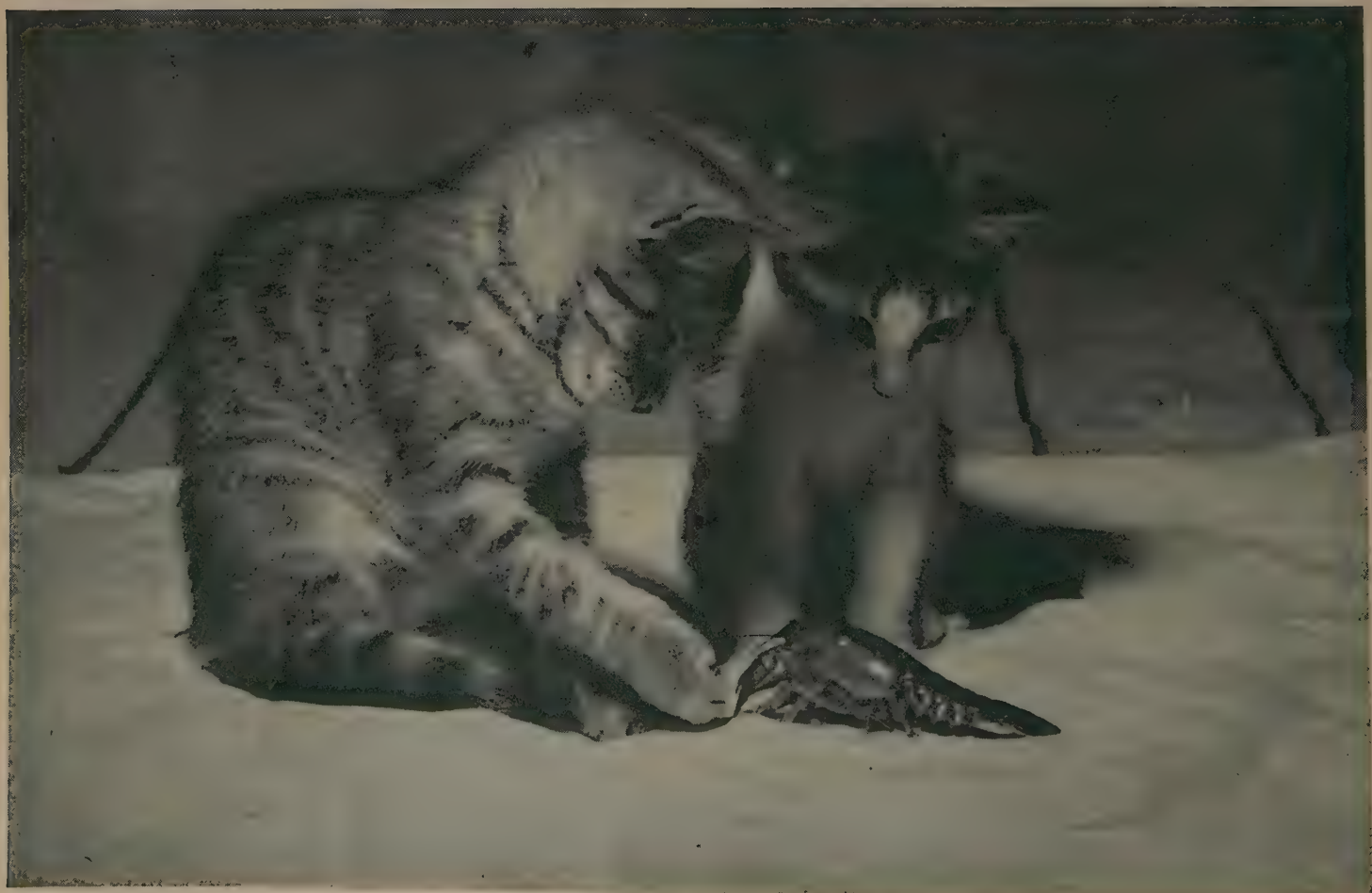
Cranesbill, or wild geranium, is more difficult than some to identify in its winter garb, while blue flax may be confused with other pods. Here they are, left and right. Look for them in the field.

The dried pods of evening primrose should be easy for the winter hiker to identify. Beardtongue, of which there are several species, is a challenge. Virgin's bower, however, should be easier.

A twig of one of the mints, and one of harebell, flank a specimen of wild parsnip in winter. Below, a willow gall is placed above a milkweed pod, with next to it more willow galls, and, at the right, a dried pod of the wild cucumber.

Prickly poppy, evening star and evening primrose provide a sharp contrast in the appearance of these plants in winter. Equally contrasting are, below, twigs of blazing star, miner's candle and mullein, all as they are seen in the winter fields.





Kittens and Crayfish

Photographs by J. M. Hood

MICE are supposed to be the traditional object of a cat's interest and playful attention. And curiosity is also supposed to be a characteristic of cats, even, proverbially, with fatal results.

In these pictures we see the reaction of a pair of kittens to the introduction into their lives of a crawfish. First there is definitely startled curiosity; then tentative investigation with the exploratory paw; then, above, the curious kitten decides to add the sense of smell to the touch of the paw in discovering the nature of this strange beast. Finally the kitten encounters the crustacean's pincers, and becomes a wiser cat.

Who Ate These Nuts?

A Study of the Gnawing Habits of Rodents

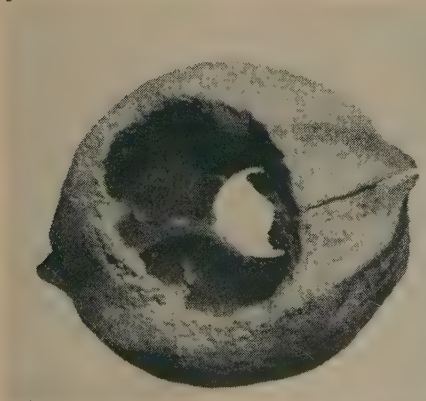
By DWIGHT E. SOLLBERGER

Hickory nuts were opened quite differently by various rodents. Captive flying squirrels made but one opening from the flattened side of the nut up to or slightly over one end. In this way they were able to extract all of the "meat."

Hickory nuts opened by chipmunks resemble those opened by flying squirrels except that the opening extends from one side around the end to the other side. Chipmunks also gnaw hickory nuts into characteristic fragments as shown in the photograph.

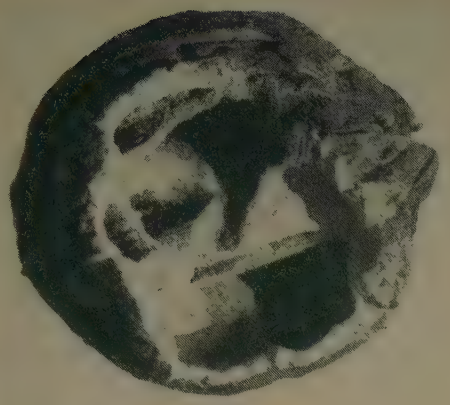
ANYONE who likes to walk in the woods knows that he will see, here and there, remains of hickory nuts, walnuts, butternuts, plum pits, and cherry pits left by some rodent. Seated on a table formed by some stump or fallen tree, a little animal of the wild has laboriously opened the nut and feasted on its nutritious contents.

The observer would be likely to pass by the nut shells as merely what was left after a feast. I was interested, however, to note that some captive flying squirrels made the same type of openings in all the hickory nuts they opened. Could this be a clue to the nut-opening habits of other rodents? Did certain little animals follow fixed gnawing habits? So nuts known to have been opened by different rodents were collected, compared and photographed. On these pages are pictured some of the gnawed nuts of this collection. The next time you pick up in the wild a nut from which the contents are gone, see whether you can guess what feasted upon it by studying the gnawings.

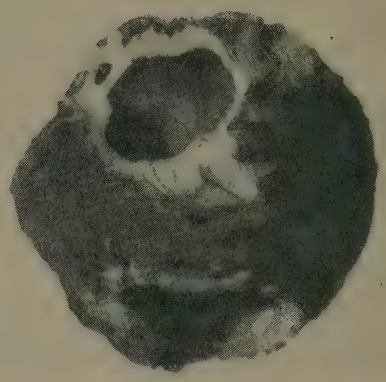


(Left) Deer mice made a hole on each side of the hickory nut. These were sometimes enlarged so as to leave only a ring of solid shell surrounding the partition.

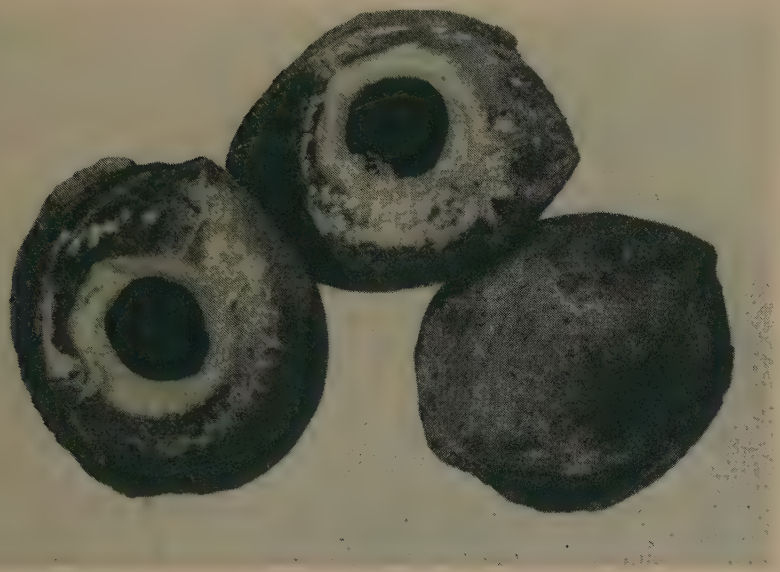
Red squirrels and gray squirrels gnaw hickory nuts into pieces that cannot be identified easily.



(Left) Captive flying squirrels open black walnuts only when other nuts are not available. Opened walnuts are passed up in favor of unopened hickory nuts. Walnuts opened by flying squirrels have a single opening with finely ground edges.



Deer mice secure the contents of walnuts by making two and sometimes three holes in the sides of the nut. These may or may not be opposite each other.



Plum pits, much enlarged, opened by deer mice. The gnawings here suggest the smaller tooth equipment of the mice as compared with the larger and more efficient, or, at least, more quickly effective dentition of the larger rodents that have extracted the food from the nuts shown in these pictures.

Red squirrels make two openings on opposite sides of a walnut that are easily distinguished from any other rodent's work by their regularity and workmanlike job. The tooth grooves are usually quite plain.

Butternuts were opened by flying squirrels by making a single opening from one side partially around one end. Gray squirrels usually make a hole on either side of the butternut, although, in some cases, they make an opening from one side around the end. They may be distinguished from butternuts opened by a flying squirrel by the greater width of tooth grooves made by the gray squirrel and by the opening usually extending down both sides of the nut.

Gray squirrels gnaw black walnuts into fragments, although, like the flying squirrels, they seem to prefer other nuts.

A Lesson about Wildlife

By LAURENCE LOWRY

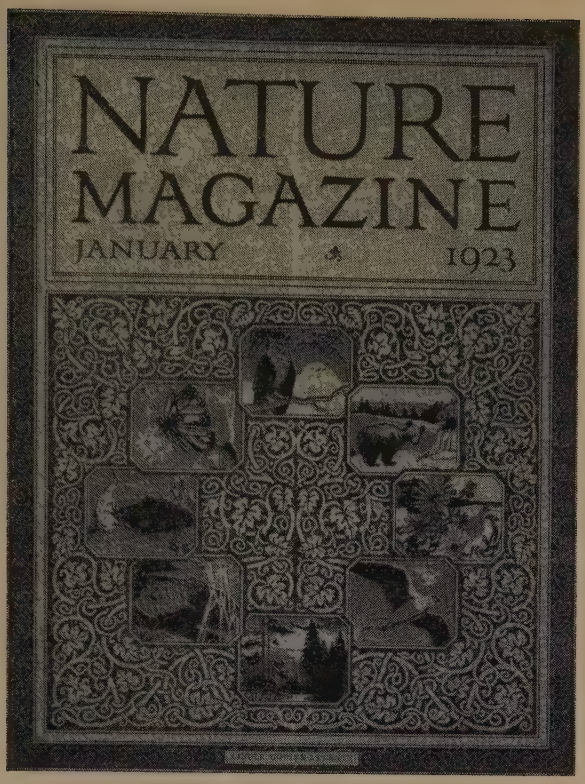
THE two pictures here really represent a lesson in wildlife. I was spending a week in northern Vermont. A neighbor's boy, knowing of my interest in birds, came to me, rather hesitantly, to ask my advice. He had, he said, struck a bird with a stone and it could no longer fly.

The youngster took me to see the victim, which turned out to be a young black-crowned night heron. A careful examination showed that the wing was bruised but not broken, and it seemed to me that the bird could recover and take wing again.

The boy felt quite badly about his accuracy with the stone, and was much interested to learn about the habits of the bird. In mitigation of his act he became a faithful nurse, every day catching fish, mostly perch, for the invalid. The bird had a hearty although not very dainty appetite.

The heron came to be known as "The Bird," and seemed to know that it was the boy who had injured it. The bird was uneasy in the boy's company, despite the food, and would try to peck at the youngster's bare feet. No one else seemed to alarm the patient.

The pictures here were taken when the bird had only recently been injured, and after it started to recover. Unfortunately I had to leave before the convalescence was over, but about a week after my return to my home in Massachusetts I received a letter from the youngster saying that the heron had flown away. It was evident from the note that a real and intimate interest in wildlife had been kindled in the boy, his bird-stoning days over.



1923—1948

A Backward Glance

BECAUSE this issue of *Nature Magazine* is our silver anniversary issue, we may, perhaps, be pardoned for talking about ourselves. Man finds pleasure in dividing time into neat little segments, from a century to a second, and a quarter-century is one of these. It seems to be a particularly significant milestone in married life, and for twenty-five years *Nature Magazine* has been wedded to the task of telling the story of Nature, conservation, and the outdoors, popularly and accurately. So, from the vantage point of maturity, we may look back to see how far we have come, and whither we are going.

In the summer of 1922, Charles Lathrop Pack set about the organization and endowment of The American Tree Association, through which he sought to give effect to his conviction that a successful forestry program for our country depended upon an informed people. He believed that if an army of citizens could be enthusiastically interested in a single tree, a grove of trees, or a small forest of trees, each individual would be a forest conservationist in the large. He amply proved his point.

At the same time his son, Arthur Newton Pack, and the elder Mr. Pack's associate in forest conservation work, Percival S. Ridsdale, saw a wider opportunity for service. It was their conviction that if people could be informed about the true facts of Nature, about the intricate relationships that exist between forests, soils, waters, and wildlife, a body of informed conservationists could be created. Therefore, in mid 1922, The American Nature Association was chartered under the laws of the District of Columbia "to stimulate public interest in every phase of Nature and the out-of-doors," and to devote its efforts "to the practical conservation of the great natural resources of America."

To carry these objectives into effect it was felt that a publication was needed. It would be popular, entertaining, informative, and accurate. It would be non-commercial and independent in its views on conservation. It would occupy a place not hitherto filled among popular publications. Magazines dealing with Nature had been, up to that time, largely directed to an audience of professional naturalists, or to those already having a lay interest in the subject. The task was to reach out and find new people; to further the work of such pioneers as Anna Botsford Comstock, whose goal was Nature study in the schools.

In those days popularization of natural history was regarded with suspicion by many naturalists, much as popular science was by most scientists. Lurid and inaccurate stories in newspapers, and in some magazines and books, had brought the charge of "nature-faking," more often than not justifiably. Among the natural scientists, however, there were some who saw the need for such a magazine as was planned, and who aided with their advice in its creation.

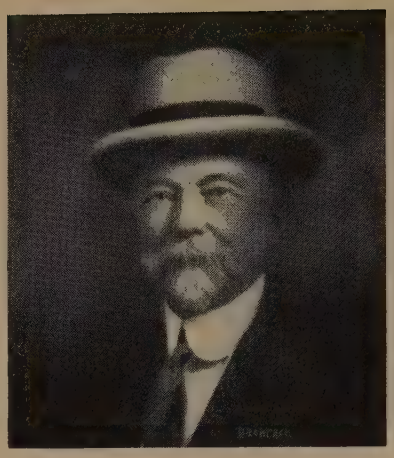
So, *Nature Magazine* was announced, and response

to the first solicitation of subscribing memberships in the American Nature Association was amazingly encouraging. After much travail, the January, 1923, issue of the magazine made its appearance under the editorship of Mr. Ridsdale, and with Mr. Arthur Pack as associate editor. Charles Lathrop Pack was President of the Association, his son, Secretary, and Mr. Ridsdale, Treasurer.

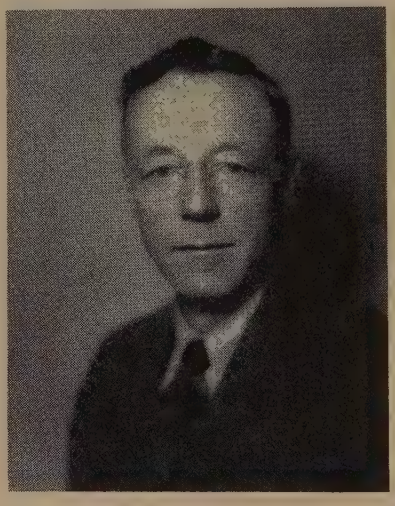
The first issue of the magazine featured as its leading article the story, "Johnny and Paddy, Two Baby Beavers," written by Vernon and Florence Merriam Bailey. Ernest Harold Baynes wrote of winter feeding of birds; Gayne T. Norton about the value of snakes in controlling rodents; L. W. Brownell started a series of tree articles with the story of the red birch; Howard Taylor Middleton presented some of his appealing squirrel pictures, and other articles ranged from one about a tree-climbing fish to one on the commercial value of peat moss.

The first year of *Nature Magazine* was a formative one. With the third issue a Scientific Consulting Board of distinguished natural scientists was formed. Many of them are still members of that same board. Early in 1923 William L. Finley joined the staff as a contributing editor and as field naturalist. Other contributing editors were Vernon Bailey, Thornton Burgess, T. Gilbert Pearson, A. Brooker Klugh, H. T. Middleton, E. H. Baynes, and L. W. Brownell. Among the early contributors of articles were William T. Hornaday, Enos A. Mills, Ernest Thompson Seton, Paul Griswold Howes, Dan McCowan, A. B. Champlain, Donald Culross Peattie, Charles Fitzhugh Talman, Francis H. Herrick, Gayle Pickwell, and Leon Augustus Hausman.

In December, 1923, Edward A. Preble joined the staff of *Nature Magazine* as its consulting naturalist, continuing to give of his vast and catholic knowledge of Nature in this post until he retired from the U. S. Biological Survey to become Associate Editor. Also, as 1923 closed, the *Nature Study Review* was merged with *Nature Magazine*, and a monthly department edited by Anna Botsford Comstock was added. In October, 1923, Richard W. Westwood, now President of the Association and Editor of the magazine, joined the staff as Assistant Editor, authoring many articles in the earlier years.



Charles Lathrop Pack, founder of the American Nature Association and its first president.



Arthur Newton Pack, cofounder of the Association and its President Emeritus.

Percival Sheldon Ridsdale, cofounder of the Association and the first editor of Nature Magazine.

With the January issue of 1924, Mrs. Isabel M. Lewis contributed her first astronomy article to the magazine, and has continued to do so with each issue since that time, which must be some sort of a record. In the fall of 1924, R. Bruce Horsfall came to Washington from Oregon to become the artist for *Nature Magazine*, and to do his series of bird, mammal, and miscellaneous pictures in color, as well as colored inserts and frontispieces. In 1924 we find, taking its cue from the then popular song, an article entitled "Yes—We Have Some Bananas." We choose to pass lightly over the selection of this title and attribute it to our youth.

The year 1925 provided another event in the history of the Association, and the Magazine, when Dr. E. Laurence Palmer became Director of Nature Education for both. Mrs. Comstock wished one of her disciples to take over her responsibilities, although she worked with Dr. Palmer until her death, and served as Associate Director of the Nature Education section. Harry E. Radcliffe, now Vice-President of the Association, joined the staff in May, 1925, as Business Manager.

In January, 1926, Charles Lathrop Pack retired as President of the Association to become Chairman of the Board of Directors, and his son succeeded him as President, continuing in that office until early 1946.

As the years passed, the Association, through the magazine and many bulletins and special publications, took an increasingly active and militant part in the fight for conservation of natural resources, always on the side of the persecuted and endangered creatures. It has long been active in the battle for roadside improvement and against commercialization and uglification of our rural highways by billboards and other intrusions. Strong stands have been taken for effective pollution control, protection

Richard W. Westwood, president of the American Nature Association and editor of Nature Magazine.

of national parks and allied areas, better protection for migratory waterfowl, reduction of cruelty in trapping and the use of ranch-raised furs, forest protection, soil conservation, as well as other current issues, such as the attempt by special interests to break down the public lands program of the country.

For a number of years the Association has made special grants to Cornell University for special studies in the conservation field, and has made other special grants from its endowment funds. These funds were created by Charles Lathrop Pack before his death in 1937, and have been augmented by other bequests.

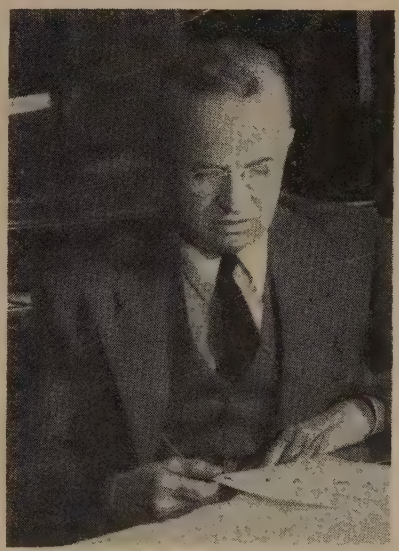
Both the Association and the magazine weathered the depression years without impairment of the work of the one or the quality of the other. The war years found both lending every support possible to winning the victory, and the many problems of administration and publication were solved with only the average number of gray hairs being acquired by those responsible for carrying on.

No backward glance over the past quarter-century should fail to pay tribute to the many loyal members and readers who have paid their dues and cherished the magazine for *all* of these twenty-five years. They number in the thousands. We thank them for their support and confidence.

To be statistical for a moment, we

Harry E. Radcliffe, vice-president of the Association and business manager of Nature Magazine.

James A. O'Hearn, secretary-treasurer of the American Nature Association.

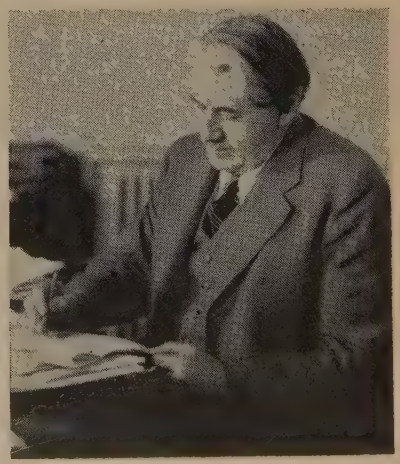


Dr. E. Laurence Palmer, Director of Nature Education of the American Nature Association and Nature Magazine.

estimate that during the past twenty-five years we have published in *Nature Magazine* a total of some eight and one-quarter million words. It staggers us to realize that we have read all those words, not once but at least four times—in manuscript and in successive proofs. This does not include uncounted millions of words read in manuscripts that have travelled back to their authors, in books sent for review, and in the course of keeping abreast of the Nature and conservation world. Some 16,000 pictures have appeared in the magazine in the past two and one-half decades, constituting a Nature picture gallery that is unequalled. The bound volumes of *Nature Magazine*, which, side by side, will soon fill the proverbial five-foot shelf, are carefully indexed and constitute a notable Nature library.

As we start on our second quarter century we can look back to having made significant contribution to progress in conservation and Nature education. Ground has been gained—substantial ground. Yet, as we look forward, we realize that forces are at work that would destroy much of the gain. Selfish interests covet areas and their resources in forest, park and public lands that have been set aside as a part of a national conservation policy. Soil is still being depleted despite the lesson of the dust bowl. Hunting pressures have grown to a degree that seriously threaten many species of (Continued on page 50)

Edward A. Preble, associate editor of Nature Magazine, who joined the staff as consulting naturalist in 1923.



A group of olive shells showing variation in size. They also vary widely in delicate colors. With the early West Coast Indians these shells served as money, for they were relatively hard to find.

The Olive Shells

By GRACE SHULTS DAVIS

EXPLORING one day in a sandy crevice among ocean-laved mossy and barnacle-covered rocks, I uncovered a little purple olive shell, *Olivella biplicata,* alive. I was fascinated. All previous specimens that I had seen had been dull and dry. This one, moist with sea spray and glowing with the life in it, showed the delicate tracery and colorings that make the olive shells distinctive.

I was not surprised that further probing failed to disclose any more of its kind, for at least one author I had read on the subject stated that the purple olive was found singly. Imagine my amazement, then, when a few days later as I scratched around in small sandy tide pools left conveniently among the rocks during a minus one and three-tenths tide at Balboa Bay, California, to uncover not several, not dozens, but hundreds of the species in one spot.

Think what wealth that would have meant to a West Coast Indian years ago! For these beautiful, rare, little shells were accepted as a monetary medium of exchange among the tribes.

To me, not their possession but to look upon them was wealth. They were in a greater variety of size, coloring and pattern tracery than I could possibly imagine to exist among specimens of a single species. The basic coloring ranged from pure white to black, although the greater number were pearl-gray and blue-gray and tan-gray. The soft grays were streaked with warm, yellow-tan and orchid, and accented with a hair line of very dark red which marked the whorls as they wound up to the apex.

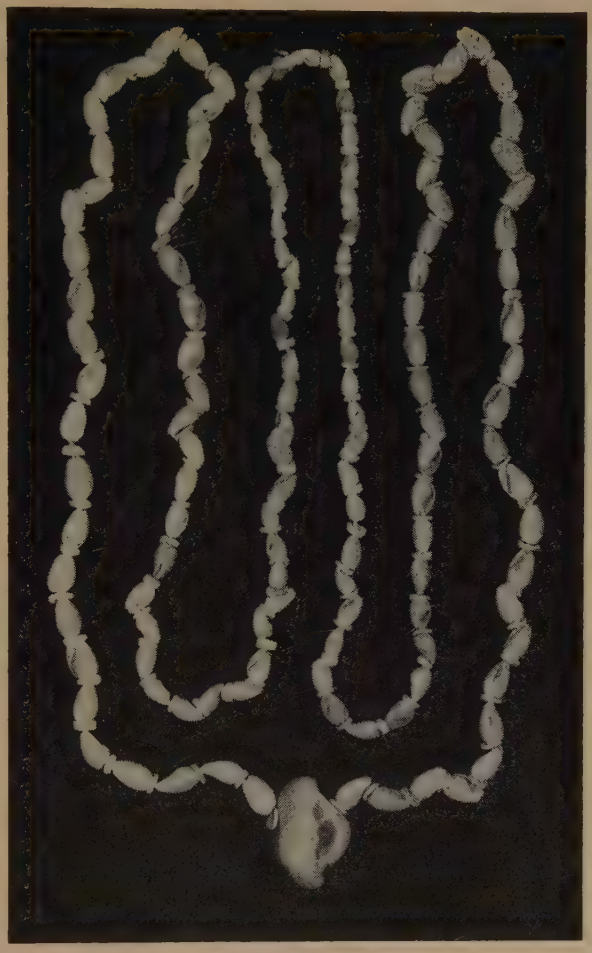
While some authorities class the pure white olive shells as a separate variety, *Olivella biplicata, var. anglina,* I am inclined to believe, since finding so great a number of them in a complete range of pigmentation, and all in one location, that Nature was simply outdoing herself in coloring a single species. In any case, I brought home, for the purposes of photography, a small number of the great herd I found, leaving the rest to pursue their undisturbed ways.

The purple olive shell is the largest of the genus, attaining a size, in the larger individuals, of an inch or better, although in the broader grouping of the family Olividae larger shells occur. Of the two dozen olives photographed together, no two are of exactly the same shade and size. In identifying the purple olive, one will observe that at the base of the columella are two little pleats, hence the name *biplicata.*

Although occurring more numerously in warmer waters, these shells have been found as far north as Vancouver in Canada. They occur southward all along the coast to the very tip of the peninsula of Lower California, allowing the collector wide range.

With redoubled interest in the family of olive shells, I visited my good friend, F. R. Aldrich, curator of the Aldrich Museum, which is housed in his spacious home on a small island in Balboa Bay, California. Having spent a lifetime at acquiring it, he has the largest shell collection in the world. In his kindly, courteous manner he showed me not only his large collection of olive shells, but many others, loaning me several specimens, including the shell necklace.

Exploring on San Nicholas Island, off the California coast, Mr. Aldrich unearthed this bauble in an old Indian grave. It had been buried for about two hundred years. To make the beads, the ends had been snipped from the tips of the shells so that they could be strung. The discs in between were cut from the sides of shells. Made entirely from purple olives, the necklace represented not only ornamentation, but wealth as a medium of exchange. The pendant, for added interest to the ornament, was made from a piece of polished bone.



An ancient Indian necklace made of purple olive shells. It was unearthed on San Nicholas Island, off the California coast.

A fossil form corresponding to *biplicata* was unearthed at Palo Verde, California, and this specimen is in the Aldrich Museum. Moore in his *Historical Geology* describes it, and shows a photograph of a similar form called *Olivella alabamiensis*. It lived in the Eocene Epoch, which would make the fossil shell rather young, geologically speaking, possibly not more than two or three million years old.

A smaller cousin to *Olivella biplicata* is *Olivella pedroana*, Conrad. It is more slender and with a relatively longer spire than *biplicata*. The color varies from almost white to very dark gray. The most usual shade is a soft pearl-gray, mottled with a pattern of wavy lines in warm brown. The deposit of enamel on the axis is white. A large specimen measures five-eighths of an inch, and they generally run half an inch, or less.

Unlike *O. biplicata*, there is no record or report of these having been found in beds containing great numbers. Although I have collected many along the coast of California, they were all encountered singly. They were easily apprehended by the lines they left as they crawled along just barely under the surface of the sand, which was below an inch or two of clear sea water. The fine track wound around, twisting, circling and doubling back on itself for several feet. Where the line ended, I could, without fail, pull a glistening *pedroana* out with my fingers. Sometimes, where a little fellow had stopped to rest, a raised pellet of sand indicated his position. Again, some of the lively little gastropods were observed in the very act of plowing along.

Olivella pedroana is abundant on the Orange County Coast. It was found first at San Pedro, California, and was named accordingly. Seeking the warmer, sheltered places on sand bars and around sand-embedded rocks, the species occurs from Puget Sound on the upper coast of Washington State to Lower California. Some literature lists this species as *Olivella baetica.*

A slightly larger form of *Olivella pedroana* is the variety *Olivella pedroana diegensis.* From present reports it seems to have a limited range in the vicinity of San Diego, California. Possibly the warm, evenly-tempered waters of that region have developed *pedroana* into a well-favored, larger form peculiar to the locality.

Two larger members of the family Olividae belong to the genus *Oliva. Oliva erythrostoma,* the red-mouthed olive is so named because of the coral-red lining of the aperture. Looking at its clean, shining, beautifully glazed, beautifully colored surface, it is hard to believe that it is found burrowing in black slime.

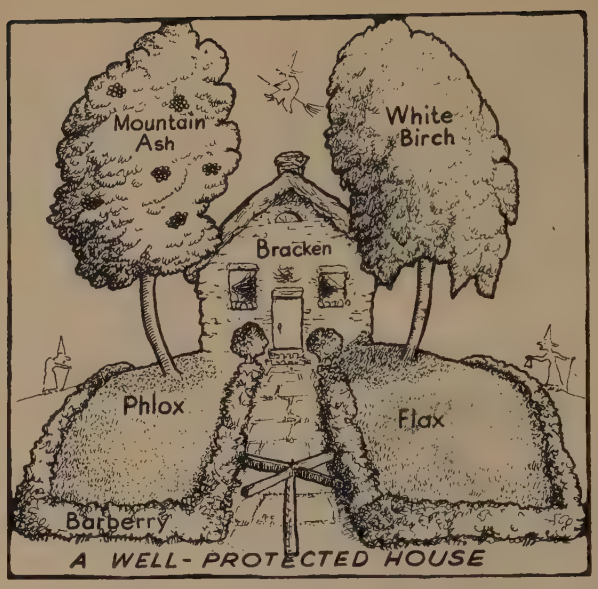
Oliva porphyria, the "Camp Shell," is the largest species of *Oliva,* attaining a length of four inches. Rich brown and coral marked with wavy dark brown tracings form the collection of little tents that give it its name. The lining of the aperture is coral. It lives in more shallow water than its smaller cousin.

There is a solidity, a dignity, and a conservative richness in the composition of shells of the family Olividae. Richly colored, the tones are yet soft.

Handling these smooth shells, enjoying their rich beauty, you marvel, fascinated, how the Greatest Artist so exquisitely fashions such lovely ceramics, using, as His only tools, small, soft-fingered snails.

Witch Insurance in the Garden

By MAY THEILGAARD WATTS



A WELL-PROTECTED HOUSE

To be read only by those who would stoop to pick a four-leaf clover.

Illustrations by the Author

IF you are troubled with witches, a mountain ash tree planted near your door may be what you need. Better still, you can fasten a branch of it over the door, or over the door of your barn. If you are too late, and they have already been in the barn, and the butter will not turn because the cows have been bewitched, then the best thing is to go to the rowan tree—which is what they call the mountain ash in the countries that seem to have had most experience with witches—and cut two switches, one for beating the cow, the other for stirring the milk. These actions, it seems, must be done simultaneously. They should cause the butter to turn.

While you are right there at the rowan tree, it might be a good idea to gather a handful of the fruits. Put them in your children's pockets, especially if they must walk to school through a lonesome piece of woods. But save a few for feeding to new lambs in the spring, for the rowan berry is a delicacy to them.

If there is no rowan tree available, it is well to remember that bracken fern has been used with equally good results. That is because the letter "C," Christ's initial, shows in the rootstock when it is cut across. Some people even find "J. C.," for Jesus Christ, and there are those who say that, if you make three cuts in succession across the root, you will see first a "G," then an "O," and then a "D." At first glance these three letters look much alike, but if you know what you are looking for you can usually find it, and the "G-O-D" is just too much for the witches—at least, no one seems to have *seen* a witch entering a door with bracken over it. While you have the piece of bracken rootstock in your hand you might as well tuck a bit of it under your pillow, to evoke a dream that will solve whatever problem you happen to have—if you happen to have a problem.

Birch trees are helpful, too. Not that they form an impassable barrier like rowan trees or bracken ferns, but it seems that witches have long been known to have a tendency to count things—like counting the steps that a horseshoe has taken, for example. And witches seem unable to pass a birch tree until they have counted its leaves. That, if you plan to run, gives you a head start, if it is summer, and the birch tree is a big one.

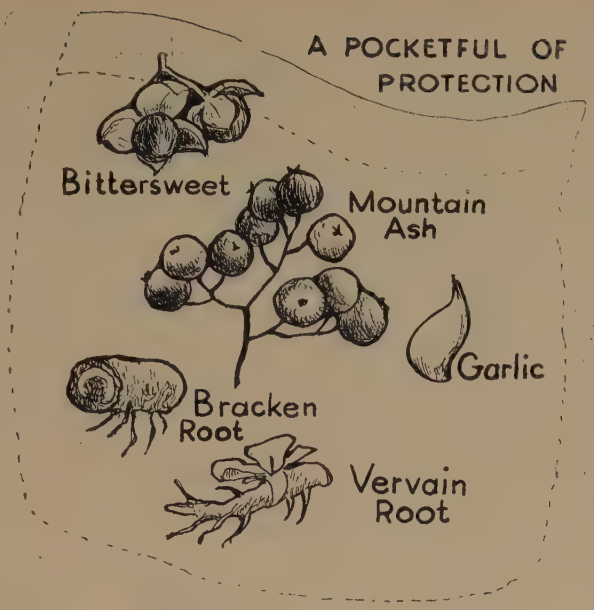
There is a chance that they may never advance as far as your birch tree, provided you have a barberry hedge. Such has long been considered potent protection. This is easy to understand in the light of research done by the folk of many a hag-ridden countryside. After many long winter evenings spent around the fire reporting, analyzing, and comparing case-histories, they have come to the conclusion that yellow flowers, because they are the color of the sun, are hateful to witches, and red is avoided whenever possible.

Instead of a gate, a turnstile made in the form of a cross is highly recommended as the entrance through your barberry hedge. But it hardly seems wise to put too much faith in the barberry hedge, even with the turnstile, in view of the fact that witches may arrive by air.

The dooryard garden may stand you in good stead. But there are two schools of thought about the wisdom of using certain garden plants. Witches need some of these for their brews; phlox, for example. Some people plant it at

both sides of both back and front doors, in the belief that witches will become so busy gathering it that they will forget to go into the house.

Flax is another on this doubtful list. There seems to be no difference of opinion about witches needing flax seed for love potions—seed collected in the full of the moon, that is—and needing it in charms to cause death to an enemy—seed collected when the moon is not full. And it seems to be agreed that witches, in spite of their craving for the seed, cannot bear the sight of a flax plant in bloom. This last information appears of slight importance in view of the fact that the flax blooms only in broad sunlight, when the witch circulation is normally low anyhow.



The real question is this: Does a clump of flax, or phlox, tend to attract witches to the dooryard, or does it set them to collecting, and send them away satisfied without having entered the home? This question is especially important in that countryside where several peasants report being forced to collect flax seed for the local witches, who seemed able to use the seeds, but not to touch the plants. If you should decide in favor of planting flax, it might be worthwhile to keep in mind the Yorkshire policy of insuring a good crop by mingling a few stolen seeds with your own.

Similar argument has long gone on about other plants. Mullein stalks, for instance, are sometimes called "Hag's Tapers" because of having been soaked in oil and carried high by witches riding to orgies. And pear trees are pleasant to have around, if you are willing to risk having some witch turn the pears into mice without tails and feed them to their cats. And then there is yarrow, which has long been known to be a part of magic brews. The question is whether to leave it out there beside the road, just beyond your fence, where it is likely to attract witches; or whether to risk being accused of witchcraft by going out to pluck it. The memory of the women who were tried for witchcraft in England just because they were seen gathering yarrow, tends to hold one back. It is a hard decision, but many a brave housewife has decided to risk her own neck to protect her young, and has gone out to pull yarrow, but hurriedly.

If there is monkshood in your garden, you may be absolutely certain that, if you ever spy a witch in the night, gathering material for her brew, she will not fail to stop at that plant. But she may have come to the garden to get herself a thimble. In that case, it will be to the foxglove or the harebell that she will go. Both are known as "witches' thimbles" in different parts of England.

In spite of having this attraction, these two plants may be worth growing for the warnings that they bring. Foxgloves are known as "dead men's bells" in parts of Scotland, because, if you hear them ringing, some dead relative is coming to take you away with him. And if you hear harebells ring during a storm, you will assuredly die in a fortnight. You have probably never known anyone who has heard either foxgloves or harebells ringing, but that could be because no one has lived long enough afterwards to tell about it. If you asked around enough, in the right places, the chances are that you could find someone who had heard of someone who had heard this fatal carillon.

There is alarm value in the bladdernut, too. When the dry bladders shake, rattling their seeds, it is a sign that witches are in the vicinity. Then people who know the signs hurry indoors.

But, even if you have a rowan tree at one side of the door, a birch at the other, bracken fastened overhead, and barberry just beyond, it is reported that witches may come down the chimney. At any rate, a person wants to leave home once in a while, whatever the risk. Then more portable protection is needed.

It is recommended that a vervain root be hung around the neck. But it should be tied with a white satin

ribbon; or bittersweet berries may be carried in the pocket. But these are best if dried on a pewter plate over a fire of hazel.

A heliotrope leaf is reported to have the power of making anyone invisible who puts it into his left shoe and recites the correct formula while putting it there. People have been experimenting for years with this formula. They have tried saying all sorts of things, inserting the leaf into the shoe in many different directions. But they remain quite visible. The trouble is that the old witch, who alone knew the formula, is dead.

On the whole, perhaps the simplest protection of all is to wear a bag of garlic around the neck. This practice was much in use in parts of Europe when witchcraft was at its height. Its efficacy seems plausible.

There is nothing new about these precautions. They bear the stamp of time upon them, and the testimony of a large and far-flung public. Probably, the number of people who have looked upon plants with thoughts of photosynthesis, or cotyledons, or dichotomous venation, is negligible in comparison with the number who have fastened a bit of bracken over the door, or carried a buckeye in the pocket, for protection.

While taking all precautions against witches, it is not well to ignore the whims of the fairies. Bad fairies have been reported, and even the good ones can be dangerous when angered. If you doubt that, take a look at the closed gentian that never gets to open any more, just because it refused entrance to a fairy who came after hours and in the rain.

St. Johnswort, for example, is innocent enough to look at. Who would suspect that this is a fairy's horse in its daylight disguise, and that any mortal who happens to step on it at twilight, just as it is changing back into a horse, will be carried away on its back, to gallop and gallop, all night long, and then will be suddenly deposited on the ground somewhere, anywhere, at dawn? Imagine how you would feel, having stepped out to look at the new moon, to find yourself galloping for hours, and then to be suddenly standing in a meadow somewhere, with nothing to prove where you had been except a little plant of St. Johnswort blooming in the grass, with you foolishly standing astride of it, and not caring to sit down for some time.

Sometimes there are clues that let you know when fairies have been around. When leaves are mottled, or birds are speckled, it shows that fairies have touched them. And where fairies have danced there may be fairy rings formed of mushrooms. It is said that four-leaf clovers grow only in the haunts of fairies, and, furthermore, that a four-leaf clover worn in the left shoe will enable you to see fairies.

There are other time-honored ways of seeing fairies. One of them is easy. You simply stand on wild thyme beside an elderberry bush on Midsummer's Eve. Another is rather complicated. It is in the Ashmolean Manuscript, as a "Choice Proven Secret Made Known."

"R/ A pint of Sallet-Oyle and put into a vial glasse but first wash it with Rose-water and Marygolde-Water the flowers to be gathered toward the East . . . Then put it in the glasse, *ut supra*: Then put thereto the buds of Hollyhocke, the flowers of Marigolde, the flowers of Wild Thyme, the buds of young Hazle: and the time must be gathered near the side of a Hill where Fairies used to be: and take the grass off a Fayrie throne. Then all these put into the Oyle into the Glasse, and sette it to dissolve three days in the Sunne and then keep it for thy use *ut supra*."

This is the "receipt." It is easy enough to get the hollyhock buds and other flowers, so that all you have to do now is to find a "Hill where Fayries used to be," and then find a "Fayrie throne," and hope that the one you happen to find will be a grassy one and not one of those common mossy ones.

Fairies live in hawthorn bushes, and quite ill-tempered ones dwell in old hawthorns. So imagine the dilemma of a knight who had inherited a vast estate. Wandering its wide expanses of heather-grown hills one day, he rested beside an ancient hawthorn. Suddenly his father's ghost appeared, telling him in spectral fashion to build a castle where the bush stood. He was caught between fear of the specter and the malignant witch that lived in the old hawthorn, which he dared not cut down. Being resourceful, the knight built the castle about the bush. The castle is Cawdor, near Inverness, famed in Macbeth.

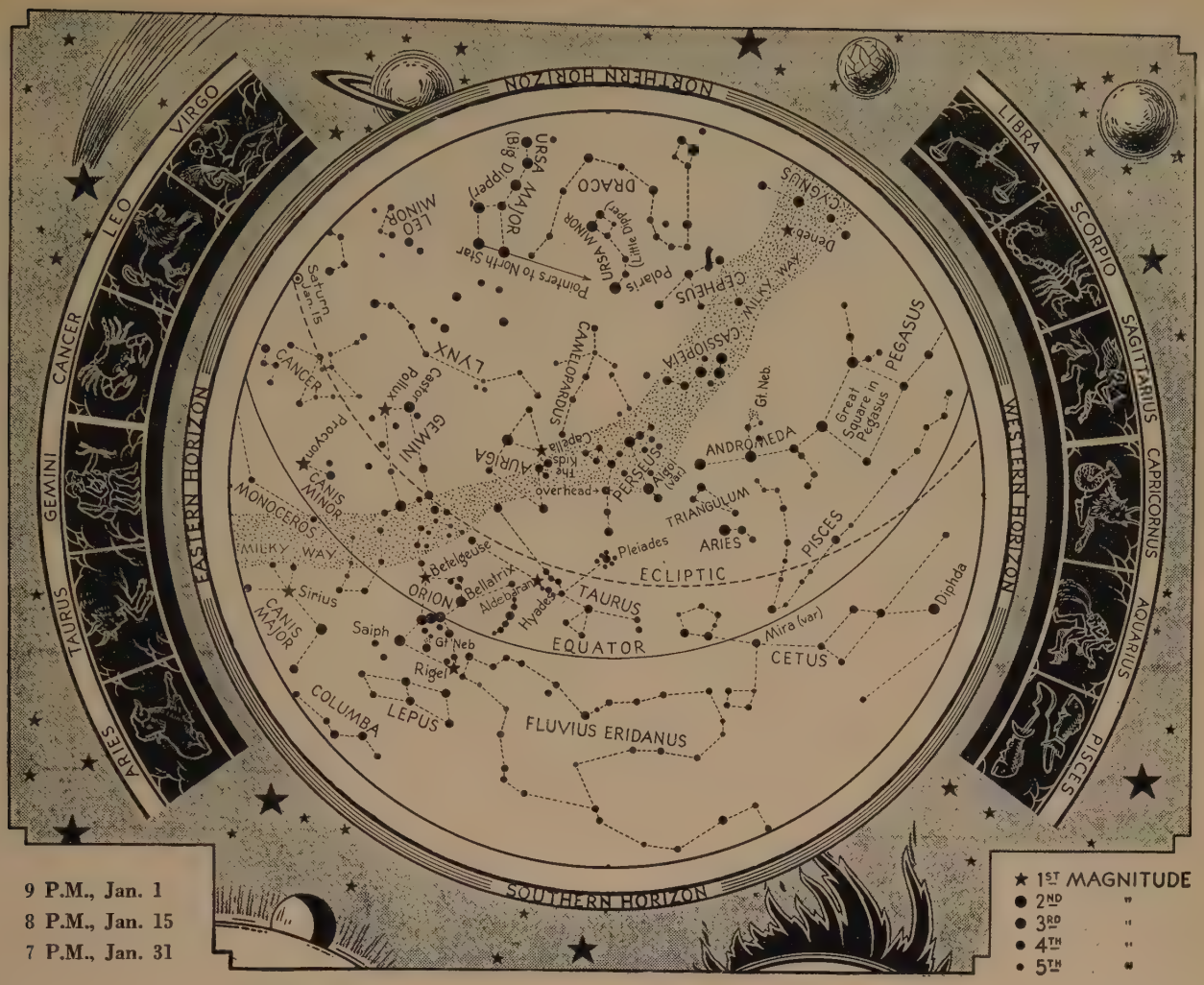
But then, probably you are not superstitious. You have never knocked on wood, or turned your right shoulder carefully toward the new moon, or wished on a first star, or been hopeful about a wish-bone, or slept on a piece of wedding cake, or fastened a horse-shoe over your door. Probably you would not even pick up a four-leaf clover. Or would you?

Case History on a Day's Sunlight

By GRACE STILLMAN MINCK

Over the greensward sunlight is dancing;
Gilding the gossamer threads that are spun—
Star-flower to daisy, daisy to bracken,
Bracken to choke-cherry. Glints of the sun
Mirror their brilliance in small pearls of dew's mist,
Dallying softly wherever they light;
Kissing the tight folded petals far open;
Warming each bud from the chill of the night.

Over the greensward, down the small hillocks,
Into the cup of the valley to lie
Spent by the stream that hums lullabies only.
Finally, creeping fear-cautiously by
Caverns of shadow, each sun-thread grown paler—
Turns with a rush and flees back to the sky.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Heavens in 1948

By ISABEL M. LEWIS

THE year 1948 should be one in which the great solar activity of the past year will be continued, although to a slightly less degree, as the past year was probably one in which the sunspot maximum occurred. The decline to minimum activity of the sun for the 11-year cycle is usually much slower than the rise to maximum, and the appearance of many large sunspot groups may be expected in 1948, with more than average auroral displays, magnetic storms, radio fade-outs and disturbances, and other phenomena associated with intense solar activity.

In the coming year, probably by early summer if all goes well, it is expected that the giant 200-inch telescope will go into action on Mt. Palomar, penetrating into space to a distance twice as great as is now reached by the 100-inch Mt. Wilson reflector, and bringing into view close to a billion galaxies. The number now within reach of the Mt. Wilson telescope is estimated to be about one hundred million. Within a few months we will write more regarding this greatest of all telescopes, and the ways in which it may be expected to contribute to our knowledge of the heavens.

The planet Mars will come again into opposition to the sun in 1948, but this will be one of the most unfavorable of oppositions. The distance of the planet from the earth at nearest approach, which occurs within a few hours or days of the date of opposition, ranges from less than 35,000,000 miles to about 63,000,000 miles. In 1948 Mars will be at opposition on February 17, and nearest to the earth on the same date several hours later. Its distance from the earth at that time will be about 62,900,000 miles. Conditions could hardly be more unfavorable for those who wish to study the surface markings of the planet at this opposition. Those in the northern hemisphere

will have an advantage over those living in the southern hemisphere, however, for at this opposition the planet will be north of the equator in Leo. Another interesting event of 1948 will be the occultation of Mars by the moon on January 27-28. This will be visible in the southeastern part of Canada, including Toronto, Montreal and Quebec, and in New York and New England. The planet will suddenly disappear behind the moon shortly before midnight on the night of January 27, and will reappear shortly after midnight. Farther south a very close approach of the planet to the moon will be observed. As Mars will be very brilliant at this time—at date of opposition equal to Canopus, the second brightest star in the heavens — this should be a phenomenon worth observing. On September 6 Mars will again be occulted by the moon, a daylight occultation, however, and so visible only in the telescope. Mars will be found at the beginning of the year in Leo a few degrees northeast of Regulus, visible in the eastern sky in the early evening; and at date of opposition, February 17, it will be visible all night. During the year it will pass from Leo through Virgo, Libra, Scorpio and Sagittarius, and at the end of the year will be about to enter Capricornus. It will be lost to view in the rays of the setting sun in December.

So rapidly does the planet Mercury dart from east to west of the sun, and so infrequently is it visible to advantage in the twilight haze, that one must know in advance when and where to look for it. In 1948 Mercury will be seen to the best advantage in the evening sky near the date of elongation that occurs on February 4, and again on May 28. Another elongation of the planet east of the sun will occur on September 25; but it will not be so well placed for observation at that time. Mercury will be best observed in the morning twilight near the western elongations that occur on September 2 and November 4, but the planet may also be found in the morning twilight, although less favorably placed, on March 17 and July 16, and for a week or more before and after these dates.

Venus will start the year 1948 in the evening sky and will improve its position, appearing higher above the horizon each night until April 14, when it will be farthest east of the sun. It will have its greatest brilliancy on May 18 as it draws nearer to the western horizon, and on June 24 it will be in inferior conjunction with the sun, as it happens, only a few hours after Mercury is also in conjunction with the sun. Both planets pass to the morning sky on that date. Venus will be again at its greatest brilliancy on July 31, in the morning sky, and on September 2 will be highest above the eastern horizon, the date of its greatest western elongation. From then until the end of the year Venus will remain in the morning sky, gradually drawing nearer to the sun.

Jupiter will be found in the morning sky low in the southeast in January, improving its position until it will be found near the meridian at sunrise on March 18. It will then rise at midnight, and earlier on successive evenings until, at opposition to the sun on June 15, it will be in view throughout the night. From then on until the end of the year Jupiter will be in the evening sky. On September 13 it will set at midnight, and by the end of December will have disappeared from view in the rays of the setting sun. During the year Jupiter will remain in the constellation of Sagittarius.

Saturn will be in Leo, northwest of Mars about 15 degrees, at the beginning of 1948. Regulus, at the end of The Sickle in Leo, will be about halfway between them. Mars will be a brilliant reddish color, increasing rapidly in brightness for about six weeks up to its date of opposition, and Saturn will be a pale yellow in color and about equal to Capella or Vega in brightness. The two planets can be easily distinguished by their respective colors and brightness. Saturn, which may remain in the same constellation for a year or more, is retrograding or moving westward into Cancer early in the year, but continues its eastward motion after reaching a stationary point on April 17. It passes again into Leo in May, and will be found not too far from The Sickle in Leo for the remainder of the year. Saturn will be visible throughout the night on the date of its opposition to the sun on February 9. It will remain visible in the evening sky until shortly before conjunction with the sun on August 19, when it will again pass to the morning sky, where it will remain until the end of the year.

The planet Uranus, which is nearly at the limit of visibility without the aid of a telescope, is in Taurus at the beginning of the year and passes into Gemini and westward again into Taurus during the year. Neptune, which is visible only telescopically, since it is of the 8th magnitude, will remain in Virgo in 1948. Pluto, most distant of all the planets, is visible only in large telescopes, resembling a star of the 15th magnitude. It will be near the boundary between Cancer and Leo throughout the year.

There will be three eclipses in 1948—two eclipses of the sun and one of the moon. The eclipse of the moon, which will occur on April 23, will be a small, partial eclipse. The magnitude of the eclipse, which is the part of the moon's (Continued on page 52)

Tonight I Followed Trails

By SUE WYATT-SEMPLE

Tonight I followed trails of shooting stars
Across the studded sky, and tried to capture
The sudden thrills of tense and flaming rapture
That comets feel when leaping astral bars. . . .

The dipper spilled its splendor over me;
Night pinned her silver crescent in my hair
And let my soul embrace infinity!

Camera Trails

By EDNA HOFFMAN EVANS

WITHOUT making any drastic predictions, thereby inviting "I told you so's" and "I knew you were wrong's" later on, it would seem that 1948 presents a bright outlook for camera fans. Except for a shortage here and there, especially in the film pack family, supplies seem to be easily and readily obtainable. Both domestic and foreign-made cameras are to be had (for a price, of course), while accessories, doo-dads and gadgets are offered in such quantities and varieties that the net result is apt to be bewildering.

But, regardless of gadgets and improvements, it is still the man behind the camera who is important. For that reason, let us first examine some of the letters from Camera Trailsmen.

MINICAM MISERIES

From Mountain Grove, Missouri, the owner of a 35mm camera writes, in part: "My preponderant photographic interests are in natural history and, so far, I've been rather disappointed with results. As a camera for snapshot portraits it's OK, but I begin to wonder whether my choice of cameras was a wise one. . . . With anything smaller than a Great Dane at three feet (closest focusing distance) you have an enormous amount of blank space, but can't get close enough to really make a picture of the subject."

This criticism of 35mm pictures, to ye editor's way of thinking, is a valid one. The original negative is so small that (unless exposure and focus have almost pin-point accuracy, any seeable enlargement is apt to be fuzzy. This is especially true when the film is processed commercially. The commercial developer, who operates on a large scale, usually does not have the time or the inclination to do "right" by hundreds of pictures that roll through his developing tanks every day. Of course, he produces a tolerable picture, but not with the same loving care that the Nature enthusiast expended in making that exposure.

Too often, alas, the secret of a good picture lies not in the original exposure. It is the development and the final printing that makes or spoils it. This fact shows up particularly in miniature negatives. It is difficult to "blow up" just a portion of a small negative, and yet most pictures are improved by the omission of some portion of the original. The Nature photographer, who shoots his subject when, where and if he can, is not able to "compose" his picture as can the still life photographer, the portrait man, or the general "posed" picture taker.

Thus, while 35mm cameras are popular, handy, easy and speedy to operate, economical and readily adaptable to both black-and-white and color film, they still leave some things to be desired when it comes to Nature photography.

Actually, though, the ideal camera has yet to be perfected.

ATOMIC SPARROW

The question discussed in a previous "Camera Trails" section (May, 1947) as to whether a song sparrow could move rapidly enough to leave two distinct images on one single exposure, has received this answer from a physicist in New Jersey:

"From the picture, I estimate that the sparrow moved a little over two inches, or, let us say, roughly 0.2 feet. By the conditions of the exposure, he was required to start from rest, get up speed, and slow down again to rest in the 1/25 second, not allowing time for the two rest periods shown in the picture. That means he moved from rest, a distance of 0.1 foot in 1/50 second. The other 1/50 second was required for the other 0.1 foot with acceleration reversed."

Using the formula for acceleration ($S=\frac{1}{2}at^2$), the physicist determined that the sparrow would have to work up an acceleration rate of 500 feet per second to do this. He then continued: "The acceleration of a freely falling body is 32 feet per second, so that our sparrow had to accelerate and decelerate 15.6 times as fast as a freely falling body.

They're off! This is the start of a famous race as depicted in the new motion picture film released by Encyclopedia Britannica Films, Inc. The picture uses real animals to enact Aesop's well-known fable of "The Hare and the Tortoise."

"In order to get any such acceleration, the force on his body would have to be 15.6 times his weight, which rules out any sort of walking such as man does in leaning forward to start motion. The sparrow would have to grip that log with his toes and pull himself forward with a force 15.6 times his own weight. Now, I know that a sparrow can grip with his toes, but I doubt if he regularly digs in for every jump forward, and we must assume that the motion was his normal motion. If our sparrow weighs one ounce, that means his force of acceleration and deceleration was at least one pound. Pretty good for a sparrow!"

It looks as though physics has cast its vote for our "double exposure" reaction. Either that, or the original photographer found an atomic-powered, jet-propelled song sparrow!

From Adrian C. Fox, head of the educational relations section of the USDA soil conservation service in Lincoln, Nebraska, have come a number of interesting items. First, there was his own well-illustrated article on wildlife photography techniques, published in *North Dakota Outdoors*. Second, there were several publications prepared by him for use by field representatives. In these, too, photographs play an important part in illustrating contour cultivation, other modern farming methods, and a clever but subtle plug for wildlife conservation.

PARAPHERNALIA

Manufacturers of photographic supplies and equipment have been especially lavish with their releases during the month in which material for this section was gathered. Some of the items, had they arrived in time, should have been included in the Christmas shopping list. But, by appearing in January, maybe they will help some reader decide how to spend that check from Uncle Leopold or that crisp bill from Aunt Arethusa.

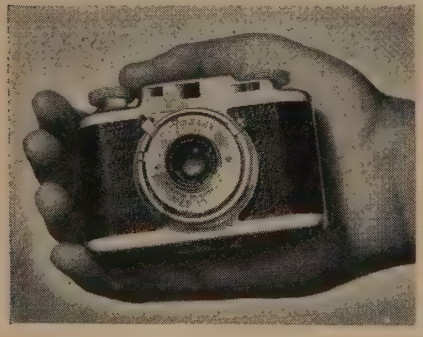
In this category are two items recently prepared by the Chess-United Company of New York. One is the EdnaLite MagniFinder (no relation to ye editor), described as a "fixed-focus precision magnifying instrument that offers maximum eye relief for magnifying and viewing all types of projected, translucent images." When the MagniFinder is placed against the ground-glass focusing screen of a reflex type camera, "the image is brought into sharp, luminous relief without need for squinting, time wasting or error."

This should be helpful to Nature photographers who are especially interested in taking pictures of flowers, or other

This is how the EdnaLite Magni-Finder is used on a small reflex camera. It is a magnifying instrument that helps in getting accurate focus.

subjects that will remain motionless the short time required for use of this instrument. Sometimes it is difficult to tell just where that important line between sharp-focus and fuzziness comes. Some cameras have a magnification device already. But, for those not so equipped, this device should be helpful. It retails for $7.50.

The Chess-United company also has prepared two special Omag de luxe filter kits—one for black-and-white photography and the other for color. There are three price ranges in each division. Filters in the black-and-white kit are Omag 0-2



The new Bolsey Model B is a 35mm camera small enough to carry in purse or coat pocket. It has an f/3.2 Wollensak lens.

(yellow-orange), Y-2 (medium yellow), G-1 (light green), and R-2 (medium red). The color kit includes Omag chromeflash, chromehaze, chromeblue and chromA. Additional information may be obtained from the company, 95 Madison Avenue, New York, N. Y. Mention "Camera Trails."

AESOP ON FILM

From Encyclopaedia Britannica Films comes the announcement of a new animal film available for schoolroom use, or by anyone, for that matter, who has motion picture projecting equipment. This new picture is a camera version of Aesop's fable "The Hare and the Tortoise," and real animals were used as actors.

The stars, of course, are a sizable gopher tortoise (or turtle, as we say in the South) and an athletic looking bunny (hare has always seemed like an awkward word to me). Other members of the cast include an owl, a fox, a rooster, a duck, a raccoon and a skunk.

Lynwood Chace, wildlife photographer, made the picture in his New Bedford, Mass., studios. Other animal classics to be filmed soon are "Fox Fables" and "The Town Mouse and the Country Mouse." Perhaps Mickey will have a real life rival, ere long.

One of the de luxe Omag filter kits prepared by the Chess-United Company. There is a set for black-and-white photography and another for color.

DISBURSING DEPARTMENT

And here are some other ways to spend that Christmas money:

If you want a camera small enough to carry in your purse or your coat pocket, the American Bolex Company's new Bolsey Model B will fit. It is scarcely more than four inches long, and less than three inches high and wide. It has a f/3.2 44mm lens by Wollensak, speeds from 1/10 to 1/200, plus time and bulb, coupled rangefinder and viewfinder, and can be used with any standard flash gun. Its retail price, low in the better 35mm field, is $50.63, tax included.

The same company is now featuring a built-in frame counter and calibrated film plane for its H-16 and H-8 motion picture cameras. The counter, which has been n accessory on older Bolex models, is still available on that basis. The calibrated film plane aids accurate focusing in close-up work.

For Leica users, two accessories are announced. First is a device which enables the use of long-focus Contax lenses on Leica cameras by means of the Stewartry Leica-Contax lens coupler. This is said to provide a "ready, quick and easy means for lens interchangeability, from one Contax lens to another, or back to the Leica lens, all with only one coupler." Second is the Leica desk viewer, available again for use in viewing 2 x 2 inch slides and 35mm strips.

In line with the increasing popularity of flash photography, Eastman offers the Kodak Photo Flasher for "handheld" flash photography. The unit, priced at $1.25 plus tax, will enable the owners of all cameras capable of "time" or "bulb" exposures to make pictures with the aid of flash lamps. The unit consists of an aluminum reflector attached to a battery case. Technique required is the traditional "Open . . . flash . . . close" routine.

And now, here's to more and better Nature photography in 1948!

Wild Flower Photographs

"For the express purpose of fostering a knowledge and appreciation of our native plants through the medium of photography as an aid in their protection and conservation," the second Michigan Salon of Native Wildflower Photography will be hung at the Michigan Flower and Garden Exhibit in Convention Hall, Detroit, March 13 through March 21. Any photographic material dealing with native plant life is acceptable. The deadline for entries is February 21, 1948. Write for details and entry form to Roger E. Richard, Box 283, West Dearborn, Michigan.

America Guide

Guide to America. Edited by Elmer Jenkins. Washington, D. C. 1947. Public Affairs Press. 705 pages. Maps. $5.00.

This handy reference book, and one that would be useful to have always in the glove compartment of one's automobile, is edited by Elmer Jenkins, National Travel Director of the American Automobile Association. Taking the States alphabetically, the editor provides general information about each State, following this with descriptions of its outstanding recreational facilities, and, then, with information about each community of any importance and its claim to fame. An interesting bibliography, arranged by States, is also provided, and a good index rounds out the volume. The maps show the location of the communities considered in each State but do not attempt to indicate routes of travel. Happening to know that Elmer hailed from Oakland City, Indiana (pp. 3068, alt. 460 ft.), we discover that he credits that metropolis only with being: "The seat of Oakland City College, Baptist."

The School Page

By E. LAURENCE PALMER

Professor of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

THERE IS NO SUCH ANIMAL

It is costing me money to write this article. Not long ago I was asked by the editor of one of our numerous children's encyclopedias to write an article on frogs and toads. I chose to develop the material to give the concept that in the group there are creatures that live in a great variety of places, develop variously and differ considerably in appearance. I called attention to the intriguing differences in the calls of the animals, from the "peep" of the peeper to the "boom" of the bullfrog. I mentioned some of the important differences in the frogs and toads as they are found from our Atlantic coast to our Pacific coast. I refrained from mentioning the bizarre frogs and toads found outside temperate North America, but did call attention to some of our more unique forms. I refrained from referring to the anatomy of the tongue or of the eye of any of the species, and definitely avoided any teleological interpretations of anything about the critters.

The article I submitted came back from the editor with some suggestions that I cannot follow. He suggested that I deal with only one species as representative of them all; that I make certain teleological interpretations. He included a sample of what he thought should be the style to be followed. This sample started off with the statement that "early in the spring," the "father bullfrog" went "Brr-ump," and then suggested many things about the bullfrog that are not so. Certainly, they are not characteristic of all frogs and toads. Of course, if you want to present the story of the activities of frogs and toads, you must recognize early spring, in spite of the fact that adult bullfrogs are many weeks from the "brr-umping" stage at that time. I suppose you can make a composite animal of the structures and activities of all frogs and toads, and, if you do not care about the facts, you can attribute them to the bullfrog, since his name, at least, is well known. But what do you have when you get through? You might as well save paper and write about "the animal," giving a composite picture that involves the stories of the invertebrates and of the vertebrates as well. There is no such animal as "*the* frog," in spite of what some of the books may tell you, and in spite of the limited appreciation some editors may have of the group of animals to which the frogs belong. Incidentally, it was suggested by this editor that the salamanders be drawn into the picture in a few closing sentences. What a sacrifice of tremendously interesting material that called for, particularly when children are so frequently adversely conditioned against the salamanders by adults who may consider them as "slimy lizards." Even that great naturalist, the late Ernest Thompson Seton, in his classical story of the kangaroo rat, showed that he completely misunderstood the role and the classification of the salamanders that my editor wanted me to include in a few sentences at the end of an impossible generalization about "the frog."

It is strange how persons react to the truth; how some prefer to gloss it over so long as the general idea sounds good. In a recent issue of *The Atlantic Monthly*, a member of the history department of Smith College wrote an "Ode to Eohippus" in which the dawn horse was represented as sporting in the dim fields with giant dinosaurs, which had vanished from the earth long before the eohippus appeared. For the fun of it, my wife and I wrote the publisher and the author about this. I admit that I included my comment in a letter that dealt with other matters, but when my answer came back the editorial staff of *The Atlantic* had completely ignored my suggestion that it would be better if the animals that were contemporary be considered in any attempt to picture life at any time in the history of the earth. Mrs. Palmer, who wrote the Smith College historian and author of the *Ode*, got a very cordial answer thanking her for pointing out the discrepancy, and stating that he saw no excuse whatever for calling upon poetic license if it meant the sacrifice of the statement of fact. We can no more telescope time by attempting to pull all ancient life into a given field at one time than we can honestly try to telescope all frogs, toads and salamanders into a description of "the frog." There is no one period of time that is representatively ancient, any more than there is any one amphibian that can adequately represent all amphibians.

If any of you want to have some real fun, take any good book showing when the various ancient reptiles appeared on the earth, then check what you find with the representations so often considered as evidence of work in "science" at the elementary levels. I have seen pictures of fights between animals whose appearance on the earth was separated by more than a million years. As recorded on this page years ago, Dr. Caster of the University of Cincinnati was asked by a movie firm to suggest the proper sound effects for such a fight. He characteristically proposed the use of the Bronx cheer.

I have no objection to the study of one creature, or of one period of time. In fact, I favor such procedure. But when it comes to thinking that any one animal represents adequately all of its contemporary relatives, or that any one period of time satisfactorily describes immediately preceding and succeeding periods, then I draw the line. Rather than accede to the wishes of this children's encyclopedia editor, and receive a check for following his advice, I should much prefer to forget the whole thing and let him get someone else to do his dirty work, if he can do so. Judging from what I have frequently read from the pens of some of the contributors to this series I am sure that he will have no difficulty in getting what he wants from someone other than me. It is true that it might be interesting to summarize in such an article the differences in structure to be found in the tongues of various frogs and toads, but why use this rather difficult-to-observe structure when there are more obvious external characters whose recognition might well enable anyone to make reasonably satisfactory field identifications. We might even grant that it was worth while to recognize tongue differences, but when my editor asked me to state that these tongue variations were made "to help" the frog get its food, then I am afraid I change cars and go off in another direction.

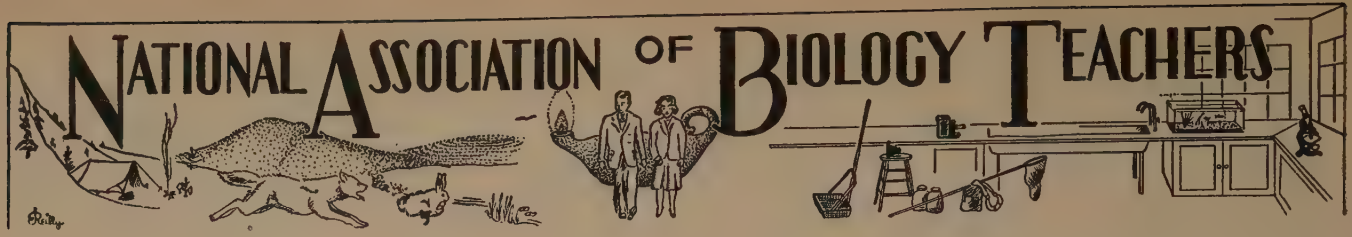
My editor insisted that, instead of speaking of the male bullfrog when writing for elementary youngsters, I should write about "father bullfrog"; instead of writing that the call was thus and so, I should say that the frog said "Br-ump." I even had to put in that mother bullfrog was presumably waiting for father bullfrog to say "br-ump" before she came out of winter hiding. Just for the fun of the thing, since I received my recommendations for procedure from the editor I have taught a few lessons with elementary children of the age for which the encyclopedia was intended. I found that they used the terms male and female freely and accurately and with no slightest sign of embarrassment, and without any stimulation on my part. Why we should have to sneak in behind such terms as father and mother, when we (Continued on page 52)

To A Ladybug

By OLIVE DRAKE

Just a moment, please,
Before you go,
There is something
I would like to know.

As I plant my ivy
In this jug,
"What is the masculine
Of ladybug?"



The NABT as a Professional Science Teachers Organization

By E. LAURENCE PALMER

At the beginning of a year, most of us find ourselves called upon to decide whether or not we shall continue to give our efforts and cooperation to this or that organization to which we may belong. As the cost of living goes up, and as our income as teachers fails to keep pace, the tendency is to try to decide where we can economize.

As public-spirited citizens most of us recognize certain obligations to remain identified with organizations that provide an opportunity for service. Some of us stay in scouting, or in the Y.M.C.A., or in church, or even in some type of political work to satisfy a need that we may feel for service.

Then there are the organizations, such as the American Nature Association, and its magazine, *Nature Magazine*, that gives us help without ordinarily asking more than nominal financial support to continue the relationship. Most of us in the natural science field agree to ourselves that there are a few "musts" in this general field. In my own case, it happens that there are four organizations of this type in which I have maintained membership from the time of their organization. I expect to continue my membership in them as long as I live and find it financially possible to do so. I am sure that *Nature Magazine* will be the last of this group that I will give up.

In addition to these organizations that give us opportunity to serve, and to the organizations that serve us, there are those of the professional type. Most of these get along on a hand-to-mouth budget, with their main objective to represent and to serve a group with more or less specialized interests. The leadership is usually shifted regularly through election, with the result that now and then some individuals have to assume financial and other responsibilities that temporarily are rather important. Having been the chief officer of a half dozen of these organizations at one time or another, I think that I can state with some assurance that the experience is not uniformly a happy one. In some of these organizations, there is more political pulling and hauling than there is in a women's sewing circle, or in the local political hierarchy.

As retiring president of the National Association of Biology Teachers, I have not the slightest hesitancy in saying that my experience in that organization has been always a happy one. I have been in organizations where service has usually been of a perfunctory nature on the part of the various committee memberships. I have been in organizations where politically ambitious groups have set out to disparage the service being rendered by rival factions. I have been in organizations where one felt that a major function was to destroy the service of other organizations serving a similar field. I am a member of one organization whose president once declared that he was prepared to eliminate competition by steam-roller methods. I have known none of this spirit, at any time, either as a member or officer of the National Association of Biology Teachers.

The N.A.B.T. has members in every state of the Union. These members represent a relatively limited field of professional service. In a great majority of cases, there can be very few persons in a community eligible for membership as compared with the situation faced by organizations serving a wider subject-matter field and a greater span of scholastic levels. Presumably, a member of this group is not just a teacher but a science teacher, and not just a science teacher but a biology teacher. This specialization of emphasis has restricted the field that presumably can be expected to give support, but it has defined the kind of assistance the membership can expect from the national programs, from the official publication and from committee action. When one considers that the National Education Association, with its approximately 400,000 members, draws its members from all ranks of teachers in all subject-matter fields, and from those engaged in administering education as well, it is obvious that the relatively few thousand members of the National Association of Biology Teachers probably more nearly approaches the to-be-expected saturation point than is the case with the organizations serving a wider field.

In recent years, the annual national programs have presented symposia on special areas in which biology teachers have special interests. In 1946 the organization published a symposium on conservation education as it bore on the teaching of biology at all levels. This month, at the meetings in Chicago, a similar symposium will emphasize the study of the responses of organisms to stimuli. This type of service would be impossible in an organization with a more generalized function. The official journal of the society, under the editorship of Dr. Breukelman, has maintained a high standard of scholarship and of editorial perfection. My own experience as an officer of the organization has been necessarily brief, since the society is so organized that the opportunity for service in most of the offices is arbitrarily limited. Of course, the major credit for the success of any organization of this type, therefore, goes to the wheel horses who bear the burdens of detail. Merl Russell, the secretary-treasurer; Dr. Breukelman, the editor of our magazine, and Mr. Roberts, its business manager, all have the respect and support of the membership of this organization. It is with complete confidence in the continued success of this unique organization that the gavel will be handed, on December 30, to the incoming president, Professor Michaud of Purdue University. I can only ask the continued support of the membership for his administration, and promise potential members that they will find in the organization an opportunity to give and to receive help that will more than justify any support they may be called upon to give.

The organization may be contacted by writing directly to Howard Michaud, Purdue University, Lafayette, Indiana. Any biology teacher with serious professional interests will find affiliation with this organization definitely worth while.

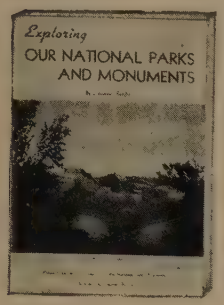
Planetarium at Home

Anyone who has visited one of the large planetariums knows the fascination of these institutions. Now comes a planetarium for science and astronomy instruction and for the use of the home astronomer. After years of experiment, this device has been perfected by Armand Spitz of Franklin Institute in Philadelphia. The constellations, through this ingenious planetarium, can be projected on any wall or ceiling, and the instrument turns on its polar axis at the rate of one revolution every four minutes. One complete revolution shows the rising and setting of the sun, moon, planets and stars. Selected study aids and current star charts are furnished with each planetarium. Portable domes, which give the device greater fidelity of reproduction than can be achieved on a flat surface, are available at extra cost. Further information may be obtained from Science Associates, 401 N. Broad Street, Philadelphia 8, Pa.

EXPLORING OUR NATIONAL PARKS AND MONUMENTS

By Devereux Butcher

A superbly illustrated, accurate and interesting book for everyone interested in our great national park system, or who plans to visit these magnificent reservations.



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American Nature Association
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Pick Your Binocular

Anyone seriously interested in selecting a binocular will find extremely useful a splendid booklet entitled "Binoculars and How to Use Them," recently issued by Bausch and Lomb Optical Company, Rochester 2, New York. A binocular is, for most of us, a lifetime investment; a precision instrument the principles of which we should understand. A poor binocular is a poor investment. In this booklet the story of binoculars is told simply, and sound advice is given on selection of a glass for the particular purposes you have in mind.

Desert Parade

Desert Parade. By William H. Carr. New York. 1947. The Viking Press. 96 pages. Illustrated, and with end maps. $2.50.

This is an excellently illustrated, popular guide to the wildlife and plants of the desert region of the Southwest. Desert flora and fauna are fascinating in their character and in their adaptation to their environment. The author, widely known and able naturalist, lives in Tucson, Arizona, and is intimately acquainted with the area about which he writes. This book is, we should say, indispensable to the visitor to the desert region, or to the resident in or on the fringes of that area.

Poisonous Desert Dwellers

"Poisonous Dwellers of the Desert" is the title of an excellent 44-page booklet published by the Southwestern Monuments Association, Box 1728, Santa Fe, New Mexico, as the third in its series of popular bulletins. The author is Natt N. Dodge. Much foolishness has been published about the poisonous character of various animal desert denizens, and several quite harmless creatures have been labelled as being dangerously venomous through superstition and ignorance. And those animals that do have some degree of defensive poison are discussed in this booklet on a factual rather than fanciful basis. Desert life is fascinating in its special characteristics, and this bulletin introduces these creatures in a proper way. The price is fifty cents.

Wild Pony Hero

Misty of Chincoteague. By Marguerite Henry. Chicago. 1947. Rand McNally and Company. 176 pages. Illustrated by Wesley Dennis. $2.50.

This is a delightful horse story written for an audience of youngsters between the ages of seven and fourteen. The author has chosen as her setting the island of Chincoteague, just off the Virginia coast, where ranges a band of wild ponies said to be descendants of a group of Moorish ponies shipwrecked there many years ago. Misty is the herocolt of the story, which is charmingly written, with suspense and beauty.

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HERBS FOR USE AND DECORATION

(Continued from page 17)

one indispensable herb to grow. After all you can always *buy* onions or garlic.

When you go beyond the few common herbs that are useful every day in cookery, you are getting into a fascinating field, indeed. In fact, the real herb addicts hardly consider the culinary herbs worth mentioning. They relegate these scornfully to the kitchen garden, and in their true herb gardens go in for the more exotic flavors and perfumes that only these sensitive souls, whose taste and scent buds are highly developed, can appreciate.

Herb teas are a delight to those who like them. As a boy I remember digging up the roots of sassafras every spring, the tea brewed from the yellow roots being considered a fine spring tonic. Besides, we liked the sweetish, pungent taste. Now I should prefer a good cup of tea or coffee. We also used to make catnip tea, just why I do not remember. The real herb fanciers today are more likely to go in for the delicate flavors of lemon thyme or lemon balm. Some folks like mint teas. Peppermint tea is said to have a decided "pickup." Chamomile makes a soothing nightcap, according to Mrs. Rosetta E. Clarkson, whose books on herbs are among the best ever written. I have visited Mrs. Clarkson's herb garden at Salt Acres, Milford, Connecticut, and can freely testify that she not only writes charmingly about herbs, but that she also grows them beautifully in her place near the sea.

Herb teas are made like any other tea by steeping a spoonful of the herb in any non-metallic teapot. A few of them, such as lemon balm, should be boiled for an instant to bring out the flavor. They are usually served without sweetening, except possibly honey, as too much sugar kills the delicate aroma.

Most herb fanciers also grow the fragrant herbs for use in potpourris, sachets and sweet bags. These not only add fragrance to a dresser drawer or closet, but they may even have some power to repel moths and other insects. In olden times, fair ladies and, perhaps, even knights and gentlemen, carried bags of herbs. These they sniffed when in crowds during plague epidemics, or whenever odors of the street became obnoxious. Herbs and other perfumes also took the place of bathing, no doubt, since modern plumbing did not exist and hot water and soap were only an occasional luxury. In peasant homes of those days, the floors were strewn with rushes and fragrant leaves of herbs. Roses or other plants were mixed with the rushes so that when one walked across the floor a pleasant odor arose. No doubt this was a welcome relief from some of the other odors that might otherwise prevail in the primitive homes of the day.

Lavender has always been a favorite. Other herbs noted for fragrance are rosemary, lemon verbena, the santolinas, ambrosia, costmary and sweet cicely. These are not difficult to grow and are worth having if only for sentimental reasons. Woad is another old-timer that is easily grown and rather decorative. Its chief interest lies in the fact that the leaves of one variety contain a blue dye that was long used in the coloring of cloth. Before that the Celts in England used to paint themselves blue with woad juice before going into battle. Caesar called these blue fighters "Picts", while the Welsh called them "the painted men", from which expression "Britain" is derived. These facts are interesting and help add color and romance to the garden.

A collection of medicinal herbs is another interesting variation from the usual theme of plants for food and beauty. The very names such as Viper's bugloss, an old cure for snakebite, and St. John's wort, which healed cuts and wounds, are both picturesque and fascinating.

Most of the common herbs can be grown from seed available from the usual sources. Tarragon, however, must be bought as a root or borrowed from a friend. Tarragon vinegar is not hard to make and is much prized by those who care for delicate flavors. Chives are usually purchased at the corner grocery. The mints can be grown from seed, but it is quicker and easier to start with a bit of root. The stems root easily from cuttings placed in water. There are several mints worth having, in addition to the usual peppermint and spearmint. Two of the choicest are orange mint and the variegated golden apple mint. These are especially desirable for mint jelly.

Start your fine seeds in a cold frame, or in a protected, sunny corner. Such things as basil will grow readily in a garden row. When the plants are large enough, they should be lifted and moved to another row or to their permanent places. You will need to label your plants for purposes of identification. The thinnings from such plants as dill can be chopped up fine and used in salads or roasts to good effect. By all means do some experimenting with flavors on your own. All kinds of exciting combinations can be achieved with a little practice.

There are, of course, a number of herb houses that specialize in selling herb essences and herb salts. Some of these firms also sell herb seeds and plants. Indeed, it is becoming quite a lucrative small business, judging from the number of people who are going into it. Some of the combination herb salts are quite intriguing, and it is useful to have them on hand. However, part of the fun is to grow your own and to share the fruits of your own garden with friends.

It is no trouble at all to cure the leafy herbs. Simply hang them up in bunches in a dry, shady place such as an attic. Direct sun or too much heat has a tendency to dispel the essential oils. Stir each day until dry. After they are thoroughly dry, strip the leaves from the stems and screen out the dust and dirt. Or you can strip the leaves off while fresh and place them on a fine screen or rack that will allow the air to pass through. The rack method is faster, but rather more trouble than just hanging the herbs up in bunches. Mints and parsley can be treated more quickly by stripping off the leaves and placing them in salted, boiling water for half a minute. Then drain off the water and dry the leaves on a fine screen in a medium-hot oven for a little while, but not long enough for the heat to drive all the flavor out of the leaves.

With herb seeds such as dill, savory, anise, caraway, fennel, coriander and cumin, wait until the seeds are ripe and brown and pick by hand on a dry day, or cut the seed heads off into a basket. Then dry on your rack, or on a heavy cloth or blanket in a dry, airy place. When thoroughly dry (watch this carefully) sieve out the dirt and dust, and, when sure that they are dry enough, store in airtight jars.

Containers for all herbs should be tight, and if glass jars are used keep them away from the sun, which will fade them. Part of the fun is to mark them nicely with colored or fancy labels. A shelf of herb jars makes a novel Christmas present for a friend who is not fortunate enough to have a garden. The jars should be uniform in size and attractive in shape so as to look well on your special herb shelf.

Try some herbs this season—sooner or later you will do so, and you might as well start now. Do not undertake too many at first; try a few of the easier ones that are most useful in the kitchen. Once you have tasted your own home-grown herb flavors and seen how fascinating they are in the kitchen garden or border, you will never be without them.

Redwood Booklets

Anyone who has seen the redwoods of California will wish to know more about them, and anyone who hopes to see them should be informed in advance. The Save-the-Redwoods League, 250 Administration Building, University of California, Berkeley 4, California, has published several attractive and valuable booklets. These are: "Trees, Shrubs and Flowers of the Redwood Region," by Willis L. Jepson; "A Living Link in History," by John C. Merriam; "Redwoods of the Past," by Ralph W. Chaney, and "The Story Told by a Fallen Redwood," by Emanuel Fritz. They sell for ten cents each. And if you do not know of the fine work of the League, write for the bulletin, "Saving the Redwoods."

Courtesy

From Lucy Gomersall of Washington, D. C., comes the following report of an observation at the National Zoological Park. Writes Miss Gomersall:

"By the side of the deep, green pond lay a heap of lettuce leaves, recently served as the evening meal for the geese, ducks and swans. I noticed noisy activity around the meal, and on more attentive observation saw that a snow goose was loudly and ferociously chasing any meal-minded member of the webbed-foot clan. Down would go his long neck until it was stretched out tautly and horizontal with the ground, and with loud 'honk-honks' he would charge all hungry invaders. Busily eating a path through the lettuce leaves were two, small, fluffy snow-goslings and mother snow goose, well aware of the vigilance of father snow goose. And then I noticed two stately sentinels floating on the water just by the edge of the shore, and quite close to the feeding snow goose family. They were beautiful black swans with bright red bills, and were watching Father Snow Goose with dignified interest, but without concern. They gracefully sat and watched until the goslings had had their fill, and Mother Snow Goose had walked away with her babies stumbling after her. It was not until she had raised her feathers and they had snuggled under her wings lost to sight for the night, that the beauties of the pond regally climbed to the shore and proceeded to eat their meal, daintily but persistently, in the presence of Father Snow Goose, who, and I am almost certain this happened, had given them a gentle bow as they climbed ashore, which could have been an acknowledgment for their courtesy."

Reasoning Orioles

Evidence of bird reasoning is contributed by Helen M. Purvis of Santa Barbara, California, describing an event at her Illinois home. A pair of orioles built a nest in a large oak near a door to the house. Great care was taken not to disturb the birds, and they successfully reared their family and departed. In the spring they were back, renovating the nest and settling down to raise another brood, although the parent birds were ever shy and elusive. Then one day, writes Mrs. Purvis, "we were startled by a terrific screaming of the parent birds as they fluttered at an open door. Then, catching sight of us, they wheeled toward their nest, then back to the door, screaming and circling back and forth, seemingly imploring our aid in some sudden difficulty. Puzzled, we hurried out and were at once led to the nesting tree, quickly seeing the cause of the frantic appeal. A snake was creeping out on the limb that held the nest. A long-handled rake was brought to bear and the snake soon discouraged, slithering from the limb to disappear. The birds chirped at us excitedly, and seemed to be saying 'Thanks! Thanks!' many times over. They quieted, however, and the mother bird soon slipped into the nest to resume her maternal duty, while her mate kept anxious watch. This proves, I am sure, that the birds not only considered us their friends, but also reasoned that we had the ability to protect their nest against the snake."

Passenger Pigeon Memorial

Appropriately located at Pigeon Hills, Hanover, York County, Pennsylvania, a memorial to the passenger pigeon has been established and dedicated to wildlife conservation by the Boy Scouts of the Conewago District of Pennsylvania. The memorial, a shaft of native stone on which is set a plate with a life-size figure of the passenger pigeon, and another plaque with a legend, was dedicated October 12 at a well-attended ceremony. The principal speaker was Dr. Herbert H. Beck, director of the Franklin and Marshall Museum, Lancaster, one of the few present who had seen the passenger pigeon in life. This memorial was originally the idea of William Anthony, Hanover historian, who read at the ceremony the following inscription that appears on the shaft: "In the interest of the preservation of wild life we here dedicate this memorial to the ill fated passenger pigeon, which from earliest pioneer days until the 1880's flocked to these pigeon hills. This migratory bird now extinct was once so plentiful its numbers darkened the skies."

Fish Resources

Fishery Resources of the U. S. By Lionel A. Walford. Washington, D. C. 1947. Public Affairs Press. 134 pages. Illustrated. $5.00.

This large-size book brings together succinctly, and illustrates graphically, the results of major investigations of the U. S. Fish and Wildlife Service into the fishery resources of the United States and its territories. It not only sets forth the current situation, but indicates what we know about these resources and what avenues of knowledge in this field remain to be explored.

Fewer Trumpeters

If there is any bird species in America that can ill afford a decline in numbers it is the trumpeter swan, snatched from the verge of extinction and still close to disaster. The birds had reached 361 individuals in 1946, but fell off to 350 in 1947. Albert M. Day, Director of the U. S. Fish and Wildlife Service, attributes the decline to illegal shooting—the birds being completely protected by law—and commercial and recreational development of the lake areas of Montana and Idaho formerly used by the breeding birds.

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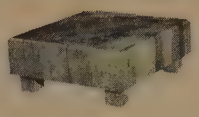

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THE SKELETON TALKS

(Continued from page 14)

sex is male.

"3. Condition of the teeth, suture closures in the skull, the articulated ends of the large and small leg bones point to the age as about fifty—plus or minus a few years.

"4. The length of the long bones, when used in the formula for stature calculation, give a height of about 5′ 8″. This, with an estimate of pelvic breadth as moderately broad, might give a body weight of about 140 pounds."

After these data were announced, a Negro woman appeared with a dentist and claimed the remains as those of her missing husband, a Negro, she assured police. The dentist, who said he had known the man for years, identified the teeth as those of the woman's spouse. "The wife and dentist, both," Dr. Krogman writes, "felt that their intimate acquaintance with the presumed deceased far outweighed the opinions of a relatively disinterested scientist. There was, I understand, a matter of insurance. . . ."

Several weeks later the woman's husband showed up, very much alive. The remains, Dr. Krogman says, were never identified.

As we mentioned, criminals have been convicted by anthropology. But of course the same skill can save an innocent man, or insure that a man is not convicted for more than his guilt. There was the case of "The Cobbler's Basement." As it turned out no anthropologist was needed —an osteologist, or bone expert, would have served.

One day Cincinnati police were given a story that a shoemaker had lured a young girl to his basement shop and killed her. The police found the body. There had been similar crimes in the area. Perhaps the cobbler could explain these too. The police dug up the earthen floor and found what they expected—a pile of bones. But when the report came back from the anthropologist, the police had a shock; every one of the bones belonged to animals—sheep, a cow, a turkey, a pigeon and several rats. Except for the rats, the bones were the remains of long-forgotten dinners. The rats had been killed elsewhere and their remains swept up with the other bones. The cobbler paid for the crime of which he was guilty; but he was saved from accusations of multiple guilt!

HELIUM, THE MIGHTY NOTHING

(Continued from page 20)

helped make aircraft both lighter and stronger.

What sort of a future is there for this modern "miracle" gas? Dr. C. W. Seibel, a pioneer in the uses and production of helium, and one who has done more than any other person to develop helium from a laboratory plaything to a plentiful product with numerous vital uses, believes that great growth in the use of this gas lies directly ahead. Since the end of the war, he has been concentrating all his remarkable talents on finding still more applications for helium. He has also offered industrial men the full co-operation of the Bureau of Mines in this respect, and also in providing adequate quantities of the gas. Dr. Seibel claims that his present objective is to produce so much helium at such a low cost that both industry and medical science will find more work for it to do.

MISTLETOE, PRIZED PEST

(Continued from page 23)

which grows as the mistletoe grows. When these enlargements are near the end of a bough they soon weigh the bough down, and this is the loot soonest to be piled into the collector's car.

I have been told, and somewhere I have read, that the berries on the mistletoe occasionally found on Monterey pine are shot from the parent plant to cling to the bark of a neighboring tree, where they begin the process of moving in. The hill on which my home stands is flanked on three sides with these endemic conifers, and I still hope to find a bunch of mistletoe and catch the little beggars in the act.

I cannot understand why anyone wants to grow mistletoe on the home ground and endanger the trees of his environment, but I have had letters asking how a would-be mistletoe grower should go about it. Some of these inquiries have come from Canada, where mistletoe is not a pest, and where, perhaps, there is little danger of its spreading. The mistletoes to grow in the northwest are *Viscum album, Phoradendron villosum* and *P. flavescens* (or one of its varieties). All of these are traditional species. I know that *V. album*, the mistletoe of literature, will grow in apple trees and poplars, and these trees would probably be acceptable hosts to the two American species, also. But as each mistletoe prefers its own host, and many refuse to grow on any other, it would be wise to know which species you are using as well as to know its natural lodging.

Choose fat, juicy berries and fairly young branches for their housing, and plant your seeds low enough on the tree for easy watching, for you will want to see what is happening. Use plenty of seed as these mistletoes are unisexual, the staminate or male flowers being borne on separate plants. Make a little slit in the bark—the spot where a smaller branch meets a larger one is a good place—and stick the berry on the slit. The under side of a branch is usually the softer, and it is best to use a branch that is out of the wind. Remember that mistletoe germinates during the rainy season, and that moisture is necessary to sprouting. When you see your berry swell, and small yellow-green shoots protrude from its lair, you will know that it is diverting the sap of your apple or poplar from the legitimate passage to all parts of the tree and drawing it to its own use, and that your efforts are a success. When the sprouts become green with chorophyll it shows that they are absorbing what they need from the air; meantime the lengthening, hidden suckers are taking sap and salt from the canals of your tree, and now you are sure that your vampire is on the first leg of his journey.

1923—1948

(Continued from page 35)

game birds and mammals. Furbearers are being over-trapped. Man-caused forest fires still destroy millions of dollars worth of our timber resources. Conservation has made progress, but it still has goals that must be reached if we are to hand on to future generations a worthy semblance of the natural wealth with which our land was endowed by a munificent Nature. This is our silver anniversary, but there is work to be done between now and our golden anniversary. Let us be on with it.

Gadgets

Campers and other outdoor goers, even picnickers, will find a new gadget known as "Hot-Grip" a handy thing to have along. It is designed to take the place of the pot-holders grandmother used to make out of bits of stray cloth. Two claws clamp on the edge of the hot dish or other container and hold while you lift same from the fire, or out of the oven. This new item is manufactured by Taylor Products Mfg. Co., 15-Rear North Cascade Avenue, Colorado Springs, Colorado. If your dealer does not have it, they do, at $.98, plus a dime for packaging and mailing.

Another gadget item is represented by the Lawncoaster made by Dake and Dake, Box 271, Grand Haven, Michigan. These are stylized tulips that spike into the ground, the "petals" of the metal flower holding a glass within their embrace. The producers will gladly send details.

Another interesting item is an electrocutor designed to put a quick end to insect pests, and even rats. It puts the moth and the flame to practical use. Insect Electrocutor Company, Box 86, Cincinnati 10, Ohio, will be glad to provide further information.

THE READER'S MARKET

A place where members of the American Nature Association and readers of Nature Magazine may find many interesting offerings or may advertise themselves, at low cost, for things wanted; things they have for Sale, for Trade, for Sale or Trade. This is an excellent forum for acquiring or disposing of such items as binoculars, books, cameras and photographic equipment, magazines, sports and outdoor equipment, etc.

GENERAL REQUIREMENTS APPLICABLE TO CLASSIFIED ADVERTISING

1. *Transactions based on good faith:* Transactions are based on good faith and mutual satisfaction. Deliberate misrepresentation, disregard of usual business ethics or the attempt to circumvent these general requirements, when brought to our attention, will result in refusal of further advertising.

2. *All orders subject to these conditions:* We reserve the right to edit all copy to conform with our standards and to reject or discontinue any advertisement which we consider undesirable.

3. *Who may advertise:* This department is an open market trading post. Any individual or firm whose advertisement and methods of doing business meet our requirements may advertise their goods or services.

4. *Rates:* All classified advertisements must be accompanied by remittance. The rate is 15c per word including name and address—minimum charge $2.00. Cash with order.

5. *How to count numerals, etc.:* Groups of figures are counted as one word. Abbreviations consisting of initials or single characters likewise are counted as one word. Hyphenated words are counted as two words.

6. *"For Sale" ads must state prices:* A specific price must be stated on all FOR SALE ads —except that the phrase "write for catalog" may be used when listing real estate or merchandise in quantities.

7. *Conditions of trade or sale:* The condition of binoculars, cameras, instruments, other equipment useful to outdoor lovers, home-owners, etc., advertised for sale or trade must be specified as follows: PERFECT—meaning factory condition: EXCELLENT—meaning new condition, implying negligible amount of use; VERY GOOD—meaning practically new condition, implying little use. with no appreciable wear and only minor surface scratches or wear; GOOD—meaning moderate condition and with only moderate wear; FAIR—meaning no parts missing necessary to use, reasonable wear inside and out; POOR—meaning marred appearance or badly worn.

8. *Non-specific phrases barred:* Phrases such as "highest" or "top prices paid", as well as any other so-called "auction-type" phrases are not acceptable. The terms "fair price paid" or "state price wanted" may be used.

9. *Blind ads not acceptable:* Box number or blind ads will not be accepted. Give your complete name and address to insure prompt delivery of all mail or telegraph replies.

10. *Requesting privilege of examination:* Purchasers desirous of examining merchandise before acceptance should request shipment by express C. O. D. with examination privilege. This procedure permits the purchaser to inspect the merchandise in local express office and authorizes the express company to return unsatisfactory merchandise at shipper's expense.

11. The association will not accept for publication in NATURE MAGAZINE, advertisements of firearms, ammunition, or patent medicines.

12. *Responsibility for illegible copy:* Type or print advertisement plainly as we cannot be responsible for errors due to illegible writing.

13. *Closing date:* The closing date of all advertisements is the 20th of the second month preceding month of issue.

ANTIQUES GLASS FOR SALE

MOON AND STAR: List for stamp. Forrest Sowers; Doylestown, Penna.

ATHLETIC GOODS

BAR-BELLS, DUMB-BELLS. Exercise equipment, courses. Free catalogues. Good Barbell Co., Dept. N, Reading, Penna.

BOOKS

NATURE LOVERS' LIBRARY—6 volumes 8½x11, 2000 pages, weight 23 lbs.; lives and habits 3000 species birds and animals described by renowned Naturalists; 1000 species illustrated, 300 in color. The Literary Mart, 8 East 33rd St., New York, offers this set to members for $29.50 payable $4.50 with order, $5.00 monthly; full refund for return in 5 days.

THE WILDCRAFTERS WORLD, a new outdoor kink and idea magazine. It's different. Quarterly, $1.00 year, 25¢ copy. Laurence Barcus-N, Terre Haute, Indiana.

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"WONDERS of the Human Body," $1.25. Christian Evidence League, Malverne, N. Y.

BIBLE STUDIES, 70 lessons, 25¢ complete. Bulletin, Box 87-N, Cathedral Station, New York 25.

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BUTTERFLIES: 15 U. S. named, including Zebra $2.00; 15 Mexican including Calico $2.00; 15 Amazon beauties including Blue Morpho $2.00. M. Spelman, 2781 Grand Concourse, New York 58, N. Y.

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DOGS

REGISTERED long eared Black and Tan fox and coonhound pups. Royce Coon, Ghent, New York.

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TELESCOPES, BINOCULARS, Microscopes—big bargain, catalog free. Brownscope Company, 24 West 45th St., New York.

HOBBIES

EARTHWORM CULTURE. A fascinating hobby; profitable home industry. Write for valuable free bulletin-review on "Earthworms: Their Intensive Propagation and Use."—Thomas J. Barrett, Earthmaster Farms, Box D-488, Roscoe, California.

NEW HOBBY CATALOGUE 10¢. Curios, Biological specimens, supplies and publications. Quivira Specialties, Topeka, Kansas.

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YOU CAN ENTERTAIN with chalk talks. Catalog 10¢. J. G. Balda, Cartoonist, Oshkosh, Wis.

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"CONCRETE BLOCK HOMES", 32 page booklet drawing, instructions on how to build, $1.00. H. C. Lightfoot, Civil Engineer, Richboro 23, Penna.

MINERALS

"ROMANCE IN STONES." Arizona rare minerals. Collectors or museum grade, 12 miniatures, assorted, colorful, brilliant, genuinely rare, $3. Sam Parker, 2160 East Van Buren, Phoenix, Arizona.

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ARTIST wishes to do drawings for Naturalists. Scientific renderings from specimen or photo. For further information—write H. Spiegel, 681 Shatto Place, Los Angeles, California.

MEXICAN MANTILLAS (Head Shawls). Universally worn by Mexican women in daily shopping or Easter bonnets. Six feet long, two feet wide. Black. Sample $1.25, dozen $12.00. MEXICAN PRODUCTS CO., 126 North Main, Tulsa 3, Oklahoma.

PHOTOGRAPHS

KODACHROMES OF THE SCENIC WEST by Douglas Whiteside, $5.50 a dozen. No film this summer? Why not send us a small deposit for an approval selection on Yellowstone, Yosemite, Grand Canyon, Tetons, and other parks. Free Catalogue. PHOTOGRAPHS OF YOSEMITE and the High Sierra from negatives by Ansel Adams. 8x10 to 16x20 $2.00 to $8.50, New Exposure Guide and Record $1.50. Best's Studio, Yosemite National Park, Calif.

POEMS WANTED

POEMS WANTED FOR MUSICAL SETTING. Send poems for immediate consideration. Hamann Service, 590 Manhattan Building, Milwaukee, Wisc.

POULTRY & SUPPLIES

RAISE FRYERS new easy way. One-man earns $500 monthly. Booklet FREE. Poultry Guild, 1046-K So. Olive, Los Angeles 15, California.

PRINTING

PRINTING MACHINERY, Type, Supplies. Lists 3¢. Turnbaugh Service, Loysville, Penna.

U OF I
LIBRARY

THE HEAVENS IN 1948

(Continued from page 42)

diameter covered by the earth's shadow, will be only 0.028, scarcely visible without the aid of a telescope. The eclipse will be observable only in the extreme western and northwestern part of North America, the Pacific Ocean, Australia, Asia, and the Indian Ocean, and the Antarctic regions.

The Annular Eclipse of the sun, which will occur west of the International Date Line on May 9, and east of it on May 8, will be a remarkable eclipse, as it will be so near the limit between a total and an annular eclipse, the moon barely falling short of covering the disk of the sun. If one were above the earth's surface at a distance of five miles or more between the northeast coast of China and Japan, he might see a total instead of an annular eclipse. The path of the annulus in this eclipse will pass from the Indian Ocean across the Malay Peninsula, over Bangkok, in Siam, and densely populated parts of China and the outskirts of Shanghai to Korea and Koitoi, in Japan, thence to the Aleutians, ending near the coast of North America. Partial phases of this eclipse will be visible in Alaska, western Canada and the extreme northwestern part of the United States at or near sunset. It is expected that this eclipse will be widely observed along the path of the annulus because of its exceptional scientific value.

On November 1 there will be a total solar eclipse that passes over the eastern part of Africa, near the equator, and isolated Farquhar Island in the Indian Ocean. The long path of total eclipse, in the aggravating way peculiar to so many eclipses, does not again touch land as it passes over a long stretch of the Indian Ocean before it leaves the earth at sunset between Tasmania and New Zealand. Partial phases of this eclipse will be visible over nearly all of Australia, as well as Eastern and Southern Africa. Astronomers and other scientists are making plans to observe this eclipse in Africa. The maximum duration of its total phase is less than two minutes, which is less than the average length of about three minutes.

Recreation Major

A new four-year major course in "community leadership in recreation" has been inaugurated at the University of Wisconsin. This course is not designed merely to produce recreation workers, but to provide "a leadership group intelligently concerned with the well-being of people in their non-working time, and especially equipped to lead in the development of a satisfying, healthy community life." Responsibility for the coordination of this program, as well as the teaching of recreation leadership courses, has been placed in the hands of Marvin Rife.

Water Needed

Writing for the Nature enthusiasts among the patients at the U. S. Veterans Hospital at Boise, Idaho, Captain Walter R. Cupp, U. S. A. Retired, sends a call for help. While the grounds of the hospital are landscaped and planted, he writes, there is no open or running water and, hence, no birds except sparrows, blackbirds and a few robins. Yet in the nearby country bird life abounds. Water could be gotten to the grounds, and a series of bird baths established, but there are no funds for such an esthetic purpose, however much an interest in bird life might serve a curative purpose. Captain Cupp, a bird lover of long standing, has tried to interest local groups without success, and now sends out a broader appeal, with the approval of the manager and the chief medical officer of the hospital. Captain Cupp's address is Drawer 212, Caldwell, Idaho.

Ferns

Genera Filicum. By Edwin Bingham Copeland. Waltham, Mass. 1947. Chronica Botanica Company. 247 pages. With 10 plates. Also available from Stechert-Haefner, Inc., New York City. $6.00.

In preparing this important botanical work, the author is motivated by the fact that progress in our understanding of systematic pteridology has been so great during the last half-century that no existing general work is much more than historical. Also, Dr. Copeland is the author of many papers dealing with this general subject that are here brought together and integrated. Thus we have a most valuable volume for the botanist's library.

The Lichen Book

The Lichen Book. By G. G. Nearing. Ridgewood, N. J., P.O. Box 338. 1947. Published by the Author. 648 pages. Illustrated.

Begun in 1941 on a subscription basis, and issued piece by piece since that time and in the face of wartime difficulties, this book is now available in a limited edition and in bound form. Mr. Nearing's work covers the lichens of the northeastern United States, and is a painstaking work for which students of these inconspicuous plants owe the author a debt. Mr. Nearing had planned to reprint the work in book form, at the same time eliminating some of the errors that crept in and some of the blemishes on the folios printed serially. A flood, however, destroyed the cuts and type, in part, so it was necessary to fall back on the previously printed signatures and cover the errata by special listing. The author points out that the work was undertaken as a personal service to friends in the Torrey Botanical Club rather than as a professional work, but he has nevertheless done a wider service, errors or not.

THE SCHOOL PAGE

(Continued from page 45)

mean male and female, at any age level, is beyond me. I admit that not everyone agrees with me on this, but this does not change the situation. I understand that one of my "Cornell Rural School Leaflets," years ago, was removed from the library of a school because it mentioned male and female.

For one, I am of the mind that it is entirely unnecessary to have to gild the lily by calling the male the father and the female the mother. I do not see why we have to imply that an animal says thus and so, that it plans to do this or that, or that its particular structures were consciously modified to meet a particular situation. The funny part of this whole matter is that members of the advisory board back of this series of encyclopedias have been most outspoken in criticizing Nature study as having the very qualities that I object to in their so-called "science" material.

I rather wonder, sometimes, if this invitation to prepare this material for this encyclopedia might not have been a trap for me. If I followed the recommendations given, and if the article bore my name, would I not feel foolish defending the philosophy I have consistently defended for so many years? Of course, I do not really believe that any trap was set, but it could be, and if I bit the bait I really would have a difficult time from now on.

The Horse

The Horse of the Americas. By Robert Moorman Denhardt. Norman, Oklahoma. 1947. University of Oklahoma Press. 286 pages. Illustrated. $5.00.

This is the story of the arrival, spread and development of the Spanish horse in the New World, starting from the planting of the first seed stock by Columbus in the West Indies. While, of course, it will appeal automatically to all horse lovers, Mr. Denhardt's equine history is equally fascinating to the average reader. Perhaps it is even more fascinating to those who do not know much about horses, or the part they have played in our history, for it provides an approach to history on horseback, so to speak.

Honey Plants

American Honey Plants. By Frank C. Pellett. New York. 1947. Orange Judd Publishing Company. Fourth Edition. 467 pages. Illustrated. $6.00.

In this new and enlarged and revised edition, the author, one of the country's leading bee authorities, covers the honey plants of America, as well as those plants that are of special value to the beekeeper as sources of pollen. This is a standard work in this field.

Malaysian Birds

Birds of Malaysia. By Jean Delacour. New York. 1947. The Macmillan Company. 382 pages. $5.00.

With this book, another volume is added to the Pacific World Series brought out under the auspices of the American Committee for International Wild Life Protection. Through this series the library of publications for popular use dealing with the flora and fauna of the Pacific has been valuably and extensively augmented. This immediate volume covers the islands of Java, Sumatra, Borneo and smaller island groups, as well as the Malay Peninsula. It is the only popular work of its kind, and will be immensely valuable to any visitor to or student of this region.

World Discovery

Discovering Our World. By Wilbur L. Beauchamp, Mary Melrose Williams, Glenn O. Blough. Chicago. 1947. Scott, Foresman and Company. 304 pages. illustrated in color. $1.64.

This is the third book in this series of basic studies in science, and is designed for sixth grade use. Units include sound, weather, earth change, germs, electric current, light, the universe, airplane flight, sources of new plants and animals, and the history of living things.

Lobster and Crab

Lobster and Crab Fishing. By W. S. Forsyth. New York. 1947. The Macmillan Company. 103 pages. Illustrated. $2.00.

This book is by a British author and about fishing for lobsters and crabs off the coasts of Britain. It is a practical book going into the mechanics of this activity. Just how applicable it is to such fisheries in the United States we are unable to say, although it should be interesting to any fishermen specializing in harvesting these crustaceans.

Among the Mayas

Maya Explorer. By Victor Wolfgang von Hagen. Norman, Oklahoma. 1947. University of Oklahoma Press. 324 pages. Illustrated. $5.00.

This is the story of John Lloyd Stephens, a New York lawyer with the spirit of adventure, whose rediscovery of Copán, lost city of the Mayas, set the stage for tremendous archaeological progress. This was in 1839. Stephens was also a writer of outstanding charm and ability. Mr. von Hagen, himself an explorer with a knowledge of the region that Stephens found in the jungle, and himself a writer of proved parts, has done here a book that is completely fascinating. The story of lost peoples and lost civilizations is ever alluring, and in this book the reader is carried back to the day of exploration more than a century ago, there to enjoy the thrill of original discovery.

Southwestern Indians

Prehistoric Indians of the Southwest. By H. M. Wormington. Denver, Colorado. 1947. The Colorado Museum of Natural History. 191 pages. Illustrated. Paper: $1.50; cloth: $2.50.

This is a popularized account of Southwestern archaeology written for the lay reader and the undergraduate student. It traces the development of southwestern cultures from a time many thousands of years before the beginning of the Christian era through the period of the Spanish Conquest.

Western Reptiles

Amphibians and Reptiles of the Pacific States. By Gayle Pickwell. Stanford University, California. 1947. Stanford University Press. 236 pages. Illustrated. $4.00.

This is a thorough exploration, in the form of a popular reference handbook, of the reptile and amphibian population of the States of Washington, Oregon and California. All of the most significant species are described from actual observation. The illustrations are largely from the voluminous files of the author, who is professor of zoology at San Jose State College and author of a number of natural history texts and popular books.

Selections from Rush

The Selected Writings of Benjamin Rush. Edited by Dagobert D. Runes. New York. 1947. Philosophical Library. 433 pages. $5.00.

Vying with Tom Paine in his uncompromising revolutionary spirit and with Benjamin Franklin in the catholicity of his interests, Benjamin Rush was a physician, naturalist and champion of social and political freedom of Colonial days. He wrote widely and on varied subjects, was a physician who was ahead of his time, an opponent of slavery, and advocate of proper treatment for the mentally ill, a deep student of the natural sciences. The selections from his writings in this book are well chosen, and, to us, that part devoted to the natural and medical sciences is of particular interest.

The Genus *Crepis*

The Genus Crepis. By Ernest Brown Babock, Berkeley, California. 1947. University of California Press. Part I, The Taxonomy, Phylogeny, Distribution and Evolution, 197 pages; Part II, Systematic Treatment, 1030 pages. Illustrated. Part I, paper, $3.50, cloth, $4.00; Part II, paper, $10, cloth $12. Both volumes, paper, $13.50, cloth, $15.

This is an important and monumental contribution of botanical literature, first discussing the genus generally and then specifically.

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Under the Microscope

By JULIAN D. CORRINGTON

PHOTOMICROGRAPHS FROM SLIDES COURTESY WARD'S NATURAL SCIENCE ESTABLISHMENT, INC.

Low power cross section of entire small muscle.

SKELETAL MUSCLE

Of the three kinds of muscular tissue recognized by the histologist, two have already been discussed in this Department: visceral or smooth muscle in the October, 1943, issue, and cardiac muscle in December, 1945. The third type is known by several names, preferably as *skeletal muscle*, since these fibers compose the muscles that move the parts of the skeleton, the muscular system of the anatomist. Voluntary muscle is another term, as most of them are under control of the will; striated or striped muscle is still another designation, emphasizing the most conspicuous microscopic feature, but one which is shared with cardiac muscle, hence not sufficiently exclusive as a name.

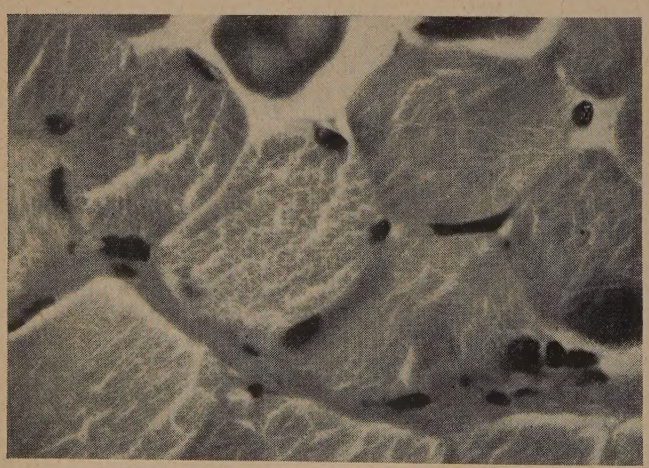
An entire muscle, such as the biceps of the upper arm, consists of a number of gross parts, recognizable upon dissection. Each end tapers into one or more tendons for attachment to bones, while the muscular portion proper is swollen throughout the middle to form the belly. The whole is invested in a fibrous sheath of connective tissue, the fascia, and is supplied with blood vessels and nerves. The larger histologic features are best seen by preparing cross sections of a complete small muscle, from cat or frog, a half-inch or less in diameter, suitable in size for mounting on a slide. The sections should be cut squarely across the long axis of the belly of the muscle, ten micra in thickness, and stained with any of the familiar routine staining combinations, as hematoxylin and eosin, or by the van Gieson technique —hematoxylin and picrofuchsin.

One of our illustrations shows a portion of such a preparation, the muscle being seen to consist of a great many *muscle fibers*, cut transversely. Around the whole and blending with the fascia is the outer connective tissue sheath, the *epimysium* (upon-muscle). The large slits and cracks within comprise the *perimysium* (around-muscle), connective tissue continuous with that of the epimysium, and more or less dividing the entire muscle into *muscle bundles*. Vessels and nerves ramify through the perimysium, which is also described as forming *septa* (singular, septum, wall) around the bundles. This tissue continues further to form slight sheaths around each individual muscle fiber, where it is termed *endomysium* (within-muscle). The epi, peri, and endomysium thus comprise a continuous connective tissue skeleton or framework that invests, supports, and protects the muscle tissue proper, and carries the necessary vessels and nerves.

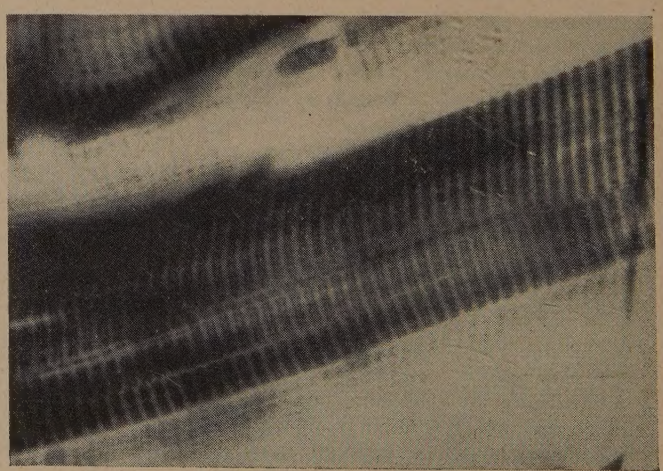
Each separate muscle is an organ, made of muscular, connective, nervous, and vascular tissues. When considered as a tissue, skeletal muscle fibers are studied in both longitudinal and cross sections, and as whole mounts of teased, isolated portions of fibers. They are far larger than other types of muscle fibers, and visible without magnification.

The most familiar view is the longitudinal section under high power, as here illustrated, showing the prominent cross striations. Such slides are easily prepared, the best stain for fine detail being iron hematoxylin, without counterstain. They provide a favorite subject for use with polarized light, the *dark bands* being doubly refractive, or anisotropic, the *light bands* singly refractive, or isotropic. The striations are seen under low as well as high power, and in fresh as well as fixed and stained muscle fibers. Chemically, the dark bands have been shown to contain less water and more solid matter than the light bands, chiefly salts of potassium and phosphorus. Under high power, in favorable places or subjects, the dark band is seen to be traversed centrally by a *lighter zone*, prominent in our illustration and, in insects, an exceedingly fine black line, *Hensen's membrane*. The light band is crossed through its center by a fine black line, *Krause's membrane*, a few of which appear faintly in the lower left corner of the accompanying photomicrograph.

In addition to these cross striations, each muscle fiber appears to be divided lengthwise by numbers of fine *fibrils*, or *myofibrillae*, embedded in a more or less fluid *sarcoplasm*



High power cross section of several muscle fibers.



High power longitudinal section of muscle fibers.

(sarco, flesh). The existence of these fibrils has been a highly debatable question. They are not seen in living fibers nor in tissue cultures; they are not detected by microdissection. On the other hand, they are conspicuous in most fixed and stained material and, as many have pointed out, the fact that they cannot be seen in living fibers does not disprove their reality. The refractive indices of both fibrils and sarcoplasm are so similar as to render their distinction impossible until the action of fixers and stains brings them out. Further, the striations are seen crossing only the fibrils, not the sarcoplasm. The two membranes, of Krause and Hensen, however, pass completely across the entire fiber and are considered to be true membranes, which interrupt each fibril in their course. Krause's membranes, bisecting the light bands, divide the fiber into transverse discs termed *sarcomeres.*

In cross section, the fibers are rounded, more often polygonal in outline, bounded by a sheathing membrane, the *sarcolemma* (flesh-husk). The fibrils may be uniformly dispersed but are frequently grouped into slightly distinct bundles, the *Cohnheim's areas,* bounded by sarcoplasm; viewed in longitudinal section, these groupings of fibrillae are referred to as *sarcostyles.* The *nuclei* in this form of muscle are peripheral in location, lying just beneath the sarcolemma; not every fiber will exhibit a nucleus in cross section, as the sectioning knife may happen to pass between instead of through nuclei; other fibers will show one, occasionally more. The nuclei are large, elongate, round in cross section, and bulge inward from the sarcolemma. This outer sheath consists of two parts, an inner structureless and very fine membrane, interpreted as the cell membrane, and an outer portion, containing its own nuclei, derived from the surrounding connective tissue endomysium. If a sarcolemma nucleus is present in a cross section of a fiber, it is very much smaller and denser than the muscle fiber nucleus, and bulges outward instead of inward.

Skeletal muscle fibers arise from simple, single cells in the embryo, termed *myoblasts* (muscle-formers). The single and centrally placed nucleus divides by mitosis in the customary manner, but the cytoplasm does not divide, resulting in an elongated cell with two nuclei. This process is repeated again and again, forming an exceedingly lengthened mass of protoplasm, still within a single cell membrane, and with a continuous cytoplasm, but a large number of nuclei. Such a cell-mass is termed a *synplasma* (together-plasm). Later the nuclei migrate to the periphery, fibrils appear, and the surrounding mesenchyme contributes to the sarcolemma. Whether or not a single fiber extends from one end of a muscle to the other is disputed, but the evidence favors the view that it does.

Two of the most important questions concerning skeletal muscle in particular and all muscular tissue in general have plagued investigators almost from the time of the discovery of the cross striations by the celebrated Dutch amateur, Antoni van Leeuwenhoek, in the Seventeenth Century. One of these has to do with the significance of the striations, and their possible role in muscle contraction. It is observed that visceral muscle, which is involuntary as to control and slow in action, is nonstriated; cardiac muscle, involuntary but intermediate in speed, is striated; skeletal muscle, voluntary and rapid, is more pronounced in striation; and the skeletal muscle fibers of the wing muscles of insects, fastest of all known types in action, are still more complex in striation, having additional bands not seen in any other forms of muscle fibers. Evidently complexity of cross banding has something to do with speed of action, but no one has yet found the key to this puzzle. Even the meaning of striations of any sort is unknown.

The other topic concerns the method of muscle fiber contraction. There have been numerous theories proposed, both physical and chemical, but none has met with general acceptance. Present belief favors the idea of fibrils at the molecular level of size, bundles of which make up the visible myofibrils. If the huge protein molecules composing these ultimate fibrils are elongate when relaxed, and are caused to shorten by chemical, electrical, or surface tension phenomena, then the fiber as a whole would shorten. Simultaneous action by the hundreds of separate fibers under synchronous stimulation by motor nerve fibers causes the entire muscle to contract. These and other problems concerned with muscular tissue await future solution.

TRADE NOTES

Ornithology A new, fifth, edition of Dr. Arthur A. Allen's *Ornithology Laboratory Notebook* is now out in a very pleasing and useful format. Earlier editions of this well-known manual have been augmented to cover southern and western portions of the U. S., or some of the bird outlines are made generalized so as to apply to any of several species, thus increasing the usefulness of the book in regions other than the Eastern States.

Work begins with topography, feather tracts, and anatomy, then the student proceeds to identify bird skins to the order, then family, and, finally, species. There are studies on nests and eggs, migration and range tables, then the bulk of the volume is devoted to life history charts for a large number of species, with full data to be filled out by the student, a map on which to indicate distribution and migration, and an outline drawing, by Fuertes, to be colored from laboratory skins. Check lists

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for field observations conclude the book. The illustrations are numerous and excellent and there is a reference list of chief publications. This is a splendid work by a celebrated teacher, for class use or for systematic pursuit of bird study by the individual who wishes to learn more about birds than merely their names. Pp. viii, 256. Comstock Pub. Co., Ithaca, N. Y., 1947. $4.00.

Neurology

A splendid revision of a famous work, best known of all general texts in this specialized medical field, is the eighth edition of Ranson's *The Anatomy of the Nervous System*. Following the death of Professor Ranson, his book carries on under the authorship of Professor Sam L. Clark, of The Vanderbilt University School of Medicine, the volume being now designated as Ranson-Clark.

Chief changes are the gathering of all the formerly scattered sections on gross anatomy into a single chapter near the front of the book (II), and the rewriting of material on reflexes and clinical cases, along with revision throughout to incorporate new information. Many excellent new illustrations appear. This work is very efficiently organized and presented, passing from gross features to histology and thence to a microscopic exposition of all parts of the nervous system, using a developmental and functional approach. A long supplement describes and figures sections of the brain at all levels, while another provides an outline for laboratory work. A 17-page bibliography is included. The illustrations constitute a major feature throughout and add greatly to an understanding of the text. Pp. x, 532; figs. 417, 14 in color. W. B. Saunders Co., West Washington Square, Philadelphia 5, 1947. $6.50.

A. S. A. M. NEWS

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Dues, $2.00 per year, including subscription to quarterly *Bulletin*, the *News Letter*, loan privileges of slide collection; combination subscription with *Nature Magazine*, $5.50 yearly.

Since our last report in these columns, the Society has progressed steadily. The *Bulletin* appears regularly and contains articles covering a wide variety of interests; some for the beginner, some for the more advanced microscopist. Recent contributions have dealt with mammalian internal parasites, bacteria of the atmosphere, technique for protozoa, wing venation in the Lepidoptera, collecting microorganisms, and the protozoa of Utah, along with shorter articles, notes, exchange and sale items, Chapter news, editorials, and book reviews. Vol. IV, No. 1, is about to be mailed as we go to press.

A new feature is the *A. S. A. M. News Letter*, a mimeographed issue sent out between *Bulletins*, thus providing for more frequent contacts and containing news and comments from and about members and Chapters. The Simon Henry Gage Loan Collection of microscope slides grows steadily and the Curator is kept busy sending out and checking in shipments to and from borrowing members. New Chapters are being formed, and recent inquiries from South Africa, Holland, and South America indicate that we may soon establish our first foreign Chapter.

Requests for application blanks, information, data concerning Chapter formation, and the like, should be addressed to the Secretary.

BEGINNER'S PRIMER

Two families of flies of more than passing interest come up for introduction at this time in our series. The Bombyliidae, or Bee Flies, are so called because many of them resemble bees or wasps. They range from small to large in size and from slim to very robust in shape; bodies are hairy and colors somber to brilliant; wings clear or partially clouded with black; large compound eyes and ocelli present; antennae three-jointed, with or without a style; mouthparts in the form of a proboscis, often very long.

Adult bee flies sip nectar and gather pollen from flowers, before which they frequently hover motionless, then dart away at high speed. They seldom alight on greenery, but choose paths, bare soil, damp ground, sticks, and stones, and especially select the vicinity of water courses. From this description it is readily seen that despite the somewhat formidable appearance and loud buzzing noises made by certain species, all are perfectly harmless and can neither sting nor bite. Chief interest in this group centers around the careers of the larvae. These exhibit a change in form as they pass through various instars, being elongate, slender, and active when first hatched; robust, relatively inactive, and maggot-like in later stages, exemplifying a rather unusual mode of development that occurs in a few groups of insects with complete metamorphosis, termed hypermetamorphosis. These larvae are either predacious or parasitic on the eggs, larvae, or pupae of such hosts as grasshoppers, beetles, caterpillars, bees, and wasps. One of Fabre's great stories deals with the life of the anthrax fly, whose larvae attack those of a certain bee in France.

The most conspicuous species, found over much of North America, Europe, and Asia, is *Bombylius major*, which attains a length of half-an-inch and is exceedingly robust. It is densely hairy and varies from white to brown, with patches of black, the front halves of the wings being also black.

Next comes the Family Asilidae, the Robber Flies or Assassin Flies. Everyone has seen these insects, which range from small size to the largest known Diptera. Some are stout and look like bumblebees, others are very elongate, somewhat like a small dragonfly. The head is free, the eyes large, the head hollowed out in front between the eyes and provided with simple, three-jointed antennae that project forward, with or without an arista or a style. The mouthparts form a proboscis which is short, stout, and projects straight downward. Both legs and wings are large and strong, as befits a bold hawker that captures his prey on the wing.

Robber flies pounce upon all sorts of other insects, even capturing such formidable and frequently larger opponents as honeybees, bumblebees, and dragonflies. Occasionally a few species have been recorded as biting man. *Asilus* and *Erax* are among the better known genera in America. The larvae live in the soil and in decaying wood, where they are predacious on other insect larvae.

Most adults are too stout, in the case of both of these families, to make satisfactory slides as whole mounts. The antennae, mouthparts, legs, and wings, however, will provide worthwhile additions to the insect slide collection.

★